

FLIGHT

The
AIRCRAFT ENGINEER
AND AIRSHIPS

*First AERONAUTICAL
WEEKLY IN THE
WORLD*

Founded in 1909 by Stanley Spooner

DEVOTED TO THE INTERESTS,
PRACTICE AND PROGRESS
OF AVIATION

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A Subsidy for Gliding?

THE value of gliding is coming to be recognised in most of the important flying countries of Europe, though more tardily in Great Britain than abroad. In that enjoyable week of September, 1922, when all the aeronautical fraternity of the country gathered on Itford Hill and Firle Beacon to watch the efforts of our best pilots in rudimentary gliders to cope with rising currents, we all said "Jolly good fun! Better than tobogganing!" It seemed just a sport, though the suggestion was heard here and there that designers might learn a good deal from it. Now, it has been shown in Germany and elsewhere that designers have learnt a good deal from it. Aeroplane pilots, too, can learn a good deal from it. Circumstances occur every now and then which may puzzle an ordinary pilot but are quite simple to the glider pilot. In several countries we understand that officers of the national flying corps or Air Force, as well as civil air line pilots, are encouraged to take a course of gliding as part of their training.

Some few years ago there was a great outburst of gliding enthusiasm in this country, and over 90 gliding clubs were formed. It proved to be a mushroom growth, and now the movement has died down to quite small, but still very sound, proportions. The real enthusiasts have remained faithful, while the rest have gone to seek their amusement elsewhere. Those who remain have done very useful work, and the excellence of that work prompts the question: Is it not time that the Government gave some financial help to the movement? Nobody would now deny that the subsidies to the Light Aeroplane clubs have been a good national investment. Gliding surely deserves, perhaps not equal help, but at least such help from public funds as may enable it to prove itself of real value to the nation. We commend this idea to the Air Ministry.

We are of the opinion, however, that when one

suggests a subsidy from the funds wrung by gruelling taxation from the public, one should also have some concrete ideas as to how that subsidy should be given. Nothing is easier than to pour money down a drain. The probability is that if the 90 odd gliding clubs of a few years ago had been given a subsidy of so many pounds for each member who gained a gliding licence, the country would now be the poorer by several thousand pounds and not much the richer by the possession of some hundreds of qualified gliding pilots who no longer glide. That sort of subsidy (in this special case, though not in all cases) would be much like forcing a plant in a hothouse and then exposing it unprotected to the rigours of the British climate.

If the State were to decide to help the gliding movement, as we hope that it will do, perhaps the most useful form which that help could take would be to establish a centre for the movement, where there would be collected all available knowledge and experience, both aerodynamical and meteorological. It would be only natural that such a centre should be located at some spot where the weather conditions permitted gliding and soaring at all seasons of the year. Great Britain may not possess quite such a wonderful site as the Wasserkuppe, but a good one could be found. On such a centre all clubs could draw for information and advice. It might be possible to arrange, too, that at this centre competent gliding instructors should be trained, as flying instructors are trained at the Central Flying School, because one of the great difficulties at the moment is the shortage of competent instructors. A second very useful form of help would be to remit for the time being the import duty on foreign gliders. A third form of help would be to aid clubs to acquire their own gliding grounds and to keep them clear of the menace of power pylons and cables. This last form of help might well be spread over a term of years. The cost of all this to the State would be comparatively small, but it would almost certainly produce results of national importance.

The Air and the "Worcester"

LAST week a novel and very significant step was taken when legal authority was given to change the Memorandum of Association of the training ship H.M.S. *Worcester* so as to include the elementary training of cadets who intend to make civil flying their calling in life.

The *Worcester* lies in the Thames off Greenhithe, and for many years it and the *Conway* have been the accepted avenues by which boys become officers of the Mercantile Marine. The ship ranks in public estimation as a public school, though hitherto it has specialised on educating boys for one profession. Now it will specialise on two professions, the mercantile marine and civil flying. The two professions are closely allied. *The Dog Watch*, the magazine of the ship, writes: "The Civil Aviator is the nearest counterpart of the Merchant Service Officer; both carry passengers, mail and goods on established lines or trade routes. Both are responsible for lives and treasure, and for keeping to a scheduled timetable under all conditions. To both there is the same call for accurate judgment, skill, resource, and quick action in emergency."

There are a number of subjects which both professions have to study. Among them are navigation, meteorology, signalling, and instruments. The Air Cadets (as they are to be called unofficially) in the *Worcester* will receive special instruction in these

subjects as they apply to flying. Though the ship possesses spacious grounds and buildings on shore, at present there will be no actual instruction in aeroplane rigging, still less any actual flying. From this beginning, however, many developments may come.

The arrangement is that, after leaving the *Worcester*, the air cadets will go on to Air Service Training at Hamble, where they will learn to fly and complete their air education. The preliminary training which they will have received should save them perhaps a year at Hamble. That will depend on the capabilities of each cadet. As everyone knows, the training at Air Service Training is of the most thorough, and the institution has been called an Air University. To this university the *Worcester* will now act as a public school.

In acclaiming this new move by the *Worcester* as unique, we are not forgetting the fine work which has been done for some years past by the College of Aeronautical Engineering at Chelsea. That college has trained engineers, and men who have trained at Chelsea also go on as a rule to Hamble to finish their course. The *Worcester* scheme does not apply to engineers, but to pilots. The two schemes are, in fact, complementary.

It seems fitting that a training ship, devoted hitherto to one element, should be the first institution of the public school class to take up special training for a second element; but it is hardly to be expected that it will always have a monopoly of preliminary air training among the public schools. It is only to be expected that other public schools will start special air classes. For the moment, however, the *Worcester* holds the field.



AUSTRALIAN-BUILT : The "Codock" monoplane (Napier "Javelin" engines) flying over Melbourne.

The Outlook

A Running Commentary on Air Topics

That Croydon Wireless Mast

SIR PHILIP SASSOON, Under-Secretary of State for Air, replying to Mr. O. E. Simmonds in the House of Commons last Monday, said that, in view of the recent and regrettable accident, it had been decided that the wireless beacon mast at Croydon should be immediately reduced in height, even though this action entailed the abandonment of any possible use for long-range navigation.

From this we deduce the fact that the lives of pilots and large numbers of passengers have been jeopardised for the sake of merely a *possible* use for the beacon. Hardly in keeping with the supreme rule of "Safety First" upon which our companies are building up their air lines, is it? Surely it is the duty of the Government department concerned so to arrange those facilities that they are in keeping with the tenets upon which the company is run. We have heard that the decision to place the mast at Croydon was by no means a unanimous one, and that other sites were approved by the technical authorities, but were turned down owing to their cost. If this is the fact, then why did the Air Ministry erect the mast at all until they had brought the Treasury to see the necessity of having it in a safe place? A place, for instance, where it could, in addition, still have been of *possible* use for long-range navigation.

The Gorell Committee

MR. SIMMONDS asked another question in the House of Commons last Monday relating to the publication of the Report of the Gorell Committee on Civil Aviation. It is common knowledge that the report (and a minority one) was submitted as long ago as the middle of April, and its publication is now eagerly awaited. Apparently it is to be presented to Parliament as a Command Paper about the end of this month. Judging from the people who, so we have heard, have given evidence before the Committee, some sound views should have been expressed. These, we feel sure, will have been sorted out and presented in that masterly and clear-headed way for which Lord Gorell is so well known. A report based upon the evidence of people concerned is always of more consequence than a report consisting merely of the personal opinions of those on a committee.

Howden

ANOTHER chapter in lighter-than-air history is being closed with the demolition of the Howden airship sheds in East Yorkshire. A Sheffield firm is systematically bringing down the massive structures.

Howden, like nearly all famous airship bases, has had a chequered career, but it has enjoyed a longer active life than many others. Established in early war years as a base for "North Sea" non-rigid ships, it was here that the ill-fated *R.38* was built for the U.S. Government, and here, of course, that the Airship Guarantee Company constructed the successful *R.100*. The *R.38* was primarily designed for high altitude work, and this necessarily involved a considerable reduction in weight. Unfortunately, static stresses, rather than aerodynamic stresses, were considered, and the ship broke her back over the Humber while the rudder controls were being tested.

There have been many suggestions that Germany's ambitious airship programme might keep Howden on the map as a port of call for the trans-Atlantic service, but the *R.101* tragedy, followed by the need for economy—false economy, think some enthusiastic minds—has meant that Howden is being dismantled and that Cardington should be merely a depressing shell with its glory departed. If airships ever return to favour, millions will be spent to replace the organisation that has been scattered to save a few thousands.

Scotland's Aerodromes

THE dearth of aerodromes in Scotland is gradually being remedied. This week details are given of the new civil aerodrome for Edinburgh which has been established at Macmerry. It is twelve miles away from the City, but flat ground of a size sufficient for an aerodrome is not always easy to find, and the longer the authorities wait the more difficult it will be for them to find sites not earmarked for building purposes. Let others be inspired by the example of Edinburgh.

Instructional Tours

ALTHOUGH club formation tours are not altogether new, there has probably never been such an ambitious one as that at present being carried out by the Bombay Flying Club, from India to England. Only in an instructional tour under the command of an experienced pilot can the average club member gain varied experience, and such a scheme might usefully become normal in the flying year of every club. Fair weather cross-country flying over known country soon bores the keen amateur, but the risk of damage to a precious machine is much too great when he is allowed to wander off by himself, for instance, over the Continent. Here, it would seem, is the solution of the problem, and here, too, is another means whereby the member's enthusiasm may be kept alive after the initial thrill of learning has passed.

Ownership Costs

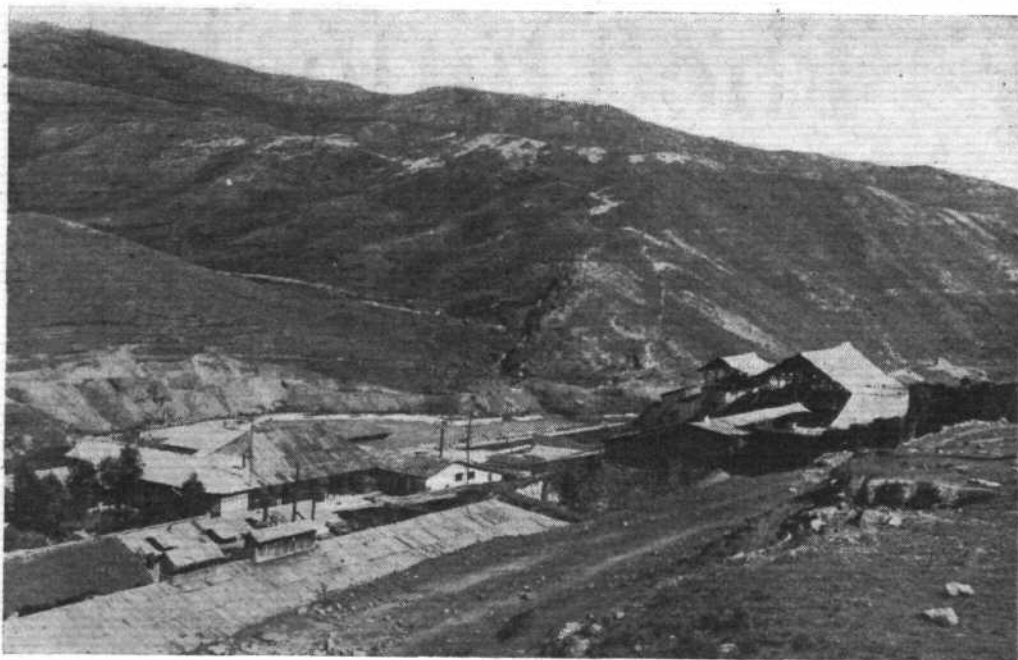
INCIDENTALLY, while on the subject of amateur flying, Maj. C. C. Turner, of the *Daily Telegraph*, quoted an interesting instance last week of a young man who proposed to run his own aeroplane on a salary of £338 per annum, plus £65 for an old car, and a balance of £130 in the bank. Of course, the thing can be done, provided that he is prepared to write off everything as a dead loss when necessary, and he had not forgotten insurance—a matter of £70. But there are many little incidentals that will appear if this enthusiast does anything but fly round the aerodrome. And the whole and only point of ownership is that one is free to go where and when one pleases, and is not tied down to a club waiting list. As for the hardship, most of us have lived on less than £117 a year when we really wanted something badly, and many of us for the sake of enjoying fifty hours' flying a year. One can only hope that this optimist will obtain really good value in trouble-free flying.

Capt. Geoffrey de Havilland

THE first award of the British Gold Medal for Aeronautics has been made by the Royal Aeronautical Society. The medal, which was founded in 1933, following a request by Lord Amulree, then Secretary of State for Air, has been awarded to Capt. Geoffrey de Havilland, C.B.E., A.F.C., F.R.Ae.S., for his work in advancing the science of aeronautics.

The award will command general approval. The brilliant work of Capt. de Havilland in his days at the Royal Aircraft Factory was beyond all praise, and the early squadrons of the R.F.C. owed him an incalculable debt for his share in producing the B.E. aeroplane alone, to say nothing of later R.A. Factory machines. Then came the long series of D.H. types, and it should not be forgotten that the D.H.2 played a large part in defeating the Fokker monoplane which spread such devastation in 1915.

Later, the D.H. "Moth" made possible the start of private flying throughout the world. Capt. de Havilland's work for civil flying and for the R.A.F. still goes on, and one can hardly conceive British commercial flying without that work. No gold medal has ever been more worthily earned.



A 12,000-FT. HIGH MINE ! The Cotabambas Mining Co.'s building at Progreso, situated at 12,000 ft., to which machinery is transported by air. (Photo Ingersoll Rand.)

AN AIR FREIGHTER IN THE ANDES

How 300 tons of Mining Plant will be flown up to 12,000 ft. in Peru

UNTIL the arrival of the aeroplane, there were only two methods of approaching the Cotabambas Gold Mine, in Peru—on foot and by mule. Four hundred years ago, when the mine first opened, plant was simple and comparatively light, but to-day modern and heavier equipment must be used, and some of it cannot be sectionised.

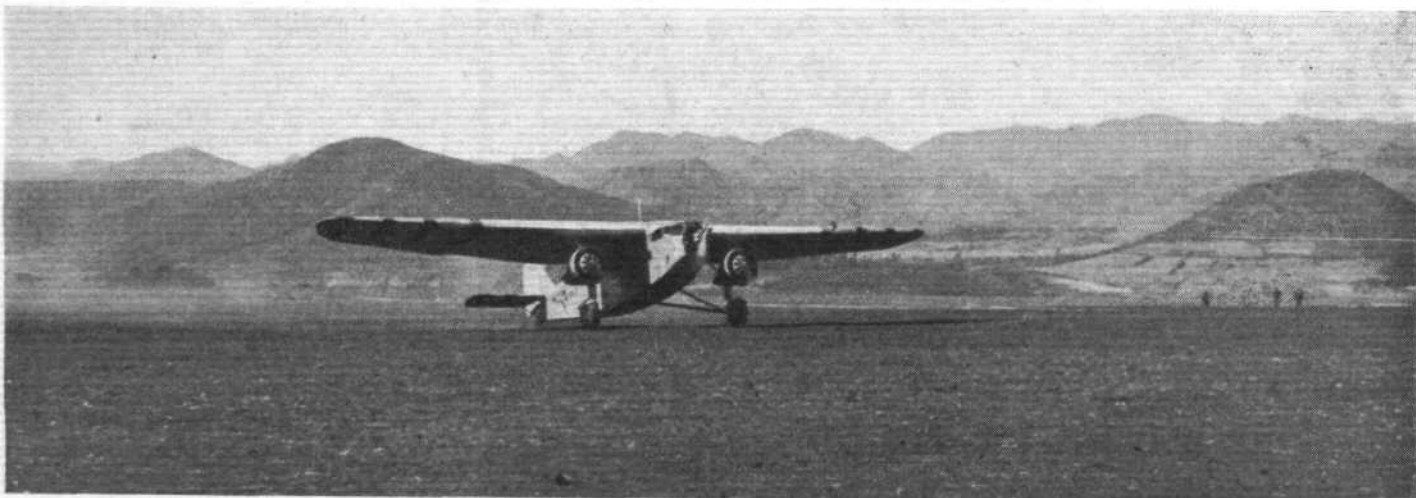
The mine is only 60 miles from Cuzco, but lies at a height of 12,000 ft., and a portion of the Andes, rising to 15,000 ft., must first be crossed. Furthermore, the installation work has to be carried out in the dry season.

Last year a Ford Tri-motor was chartered from Pan American-Grace Airways, and the experiment was so successful that plant, manufactured, incidentally, by the Frazer & Chalmers Engineering Works, of Erith, Kent, is again being "shipped" by air. The Ford is fitted with three supercharged Pratt & Whitney "Wasps," and was

tested to fly on two engines with full load at 15,000 ft. A large opening above the fuselage was arranged for loading the larger sections, some of which made up a pay load by themselves. Again special conversion work will be necessary in order to cope with single masses as heavy as 3,000 lb., and totalling some three hundred tons.

Flying is only possible during June and July, so that any delay would mean that the mine would be without perhaps indispensable parts of its new plant for a further twelve months. Actually, each trip will take some thirty to thirty-five minutes, which, allowing for loading and unloading, means that an average of four trips will be possible each day.

Now that one has shown the way, it is possible that other South American companies will find, as the New Guinea miners have found, in aerial transportation the solution of their problems.



THE FORD FREIGHTER : The Tri-motor Ford which, in conveying machinery, etc., to the mines 12,000 ft. up, has to clear part of the Andes into the bargain ! (Photo Ingersoll Rand.)

COMMERCIAL AVIATION

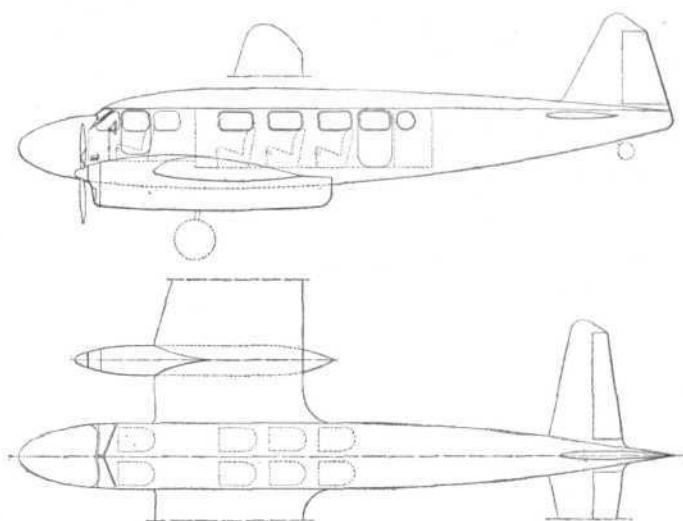
— AIRLINES — AIRPORTS —

FOR FRENCH FEEDER-LINES

The Caudron C.440 Monoplane

OF special interest at the present time in view of the fact that we published, last week, preliminary descriptions of three British feeder-line machines, the Caudron C.440 is a French example in this class now nearing completion. The machine, which bears a distinct "family resemblance" to the Caudron C.430 two-seater which we have already described, and which obviously owes much of its fine performance to lessons learned by the Caudron company in the construction of their "Coupe Deutsch" racers, is a twin-engined, low-wing cantilever monoplane carrying six passengers and a crew of two. The cantilever wing is of wooden construction and is in one piece. It is surfaced with plywood to make it water tight, providing means of flotation in cases of emergency. Similar construction is used for the tail plane, which is adjustable in flight. The fuselage is of wood covered with fabric.

A hydraulically retractable undercarriage consisting of two independent forks, containing wheels with



CAUDRON C. 440

Dimensions

Wing Span	57 ft. 9 in. (17.60 m)
Overall length	43 ft. 7 in. (13.28 m)
Height	6 ft. 5 in. (1.960 m)
Wing area	430 sq. ft. (40 m ²)

Weights

Weight empty	3,947 lb. (1 790 kg)
Useful load	1,676 lb. (760 kg)
Gross weight	6,615 lb. (3 000 kg)

Loadings

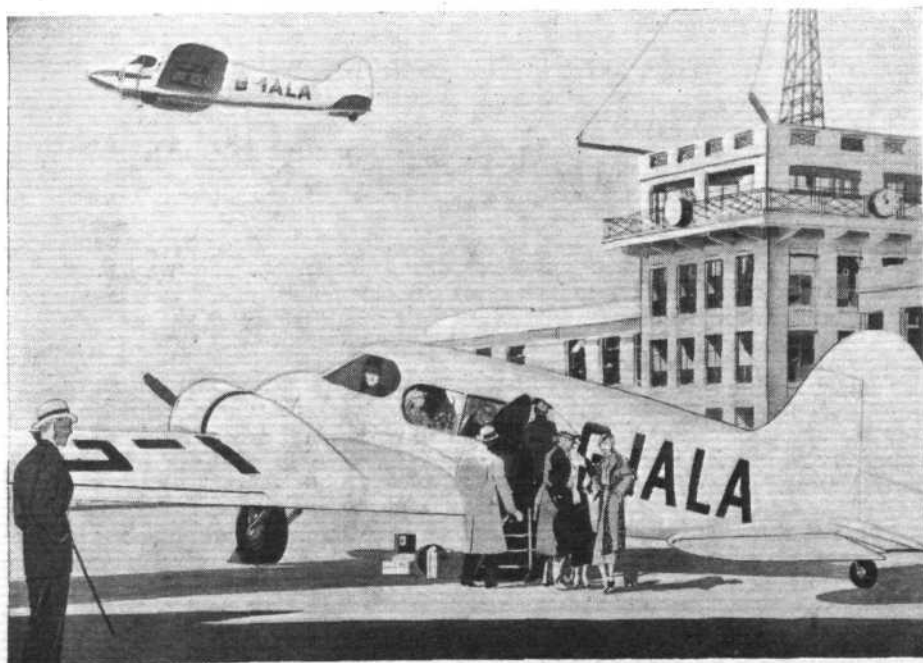
Wing loading	16.81 lb./sq. ft. (82 kg/m ²)
Power loading	17.58 lb./h.p. (7.85 kg/cv)

Estimated Performance

Maximum speed	180 m.p.h. (290 km/hr)
Cruising speed	162 m.p.h. (260 km/hr)
Landing speed	59 m.p.h. (95 km/hr)
Range in still air	1,242 miles (2 000 km)
Ceiling	16,400 ft. (5 000 m)
Ceiling with one engine stopped	6,562 ft. (2 000 m)

differentially-controlled brakes, is fitted. The tail wheel is also retractable.

Two Renault engines of 210 h.p. each, using Ratier variable pitch airscrews, are mounted in the noses of long nacelles. These engines have been developed from the Renault engines of 310 h.p., which were used for the Coupe Deutsch contest. They are unsupercharged and, apparently, have been generally "de-tuned" for increased reliability. Dual control may be fitted in the pilot's cabin. The main cabin contains six armchairs with adjustable backs, and a lavatory is provided at the rear. There are two luggage compartments in the wing and space for mail in the engine nacelles. We reproduce, through the courtesy of *Shell Aviation News*, a plan and elevation of this machine.



THE IMMEDIATE FUTURE: An artist's conception of the Avro 652 (two "Cheetah") briefly described in "Flight" last week. Two machines of this type have been ordered by Imperial Airways. The Caudron monoplane described above is in the same class, and a comparison between the two machines is interesting. The French example has considerably lower power than the Avro, is claimed to be faster and to land more slowly. Both types carry six passengers.

CROYDON

LAST week I omitted to mention a commercial record, as I believe it is, made by pilot Noah of the D.L.H. between Berlin and London with one of the service "J.U.52" machines. Actual flying time was 3 hr. 55 min., not counting the necessary stop of a few minutes in Amsterdam. There were 13 passengers on board, and the journey was made at a speed of something like 165 m.p.h. In this case 13 was a lucky number evidently.

Since the opening of the K.L.M. line between Holland and Hull-Liverpool pilots of that company often leave Croydon for Holland by one of the early morning machines and then fly from Amsterdam to Hull and Liverpool in the afternoon. The contrast they tell me is great, as the northern aerodromes are somewhat primitive. It is not enough to give Mayoral banquets during which the slogan "Croydon of the North" is freely used. It will be some years yet before the facilities in the north are even up to the standard of Croydon five or six years ago.

Syrinx, sister ship to *Scylla*, was delivered at the airport last Friday. Her registration is G-ACJK. Capt. Walters took the machine on the Saturday morning service to Paris. Passengers express admiration at the cabin comfort, and an impressive feature is the Captain's gangway, which is a nautical looking affair wheeled up to the cockpit door for the commander, first officer and the rest of the crew to descend by. I am not sure it ought not to be wheeled away with the Captain standing to attention on the sort of rostrum on the top of the steps. Joking apart, it adds greatly to the dignity of departure and arrival, and companies whose pilots still emerge from the passenger's door may well be jealous.

Syrinx is said to have certain rudder modifications which, it is whispered, give her an extra 8 m.p.h. cruising speed. Mr. Anthony Eden on his way back from Geneva via

Paris travelled by *Scylla*, and spoke highly of the comfort of his trip. He is a regular traveller and his opinion is valuable. Air travel enabled him to report at the Foreign Office and to attend a constituency meeting the same afternoon in Warwickshire.

K.L.M. was the last of the companies to taxi machines to and from the hangars. A "Fordson" tractor is now used for towing. It is more businesslike, less noisy and saves a lot of fuel in the year. Capt. Olley is back at Croydon after a successful "pleasure flight" fortnight centred at Carlisle. He tells me day trips to Blackpool and the Isle of Wight were most popular.

Railway Air Services, Ltd., Croydon-Cowes service, operated by Spartan Air Lines, Ltd., is doing well. There is a small but steadily increasing passenger traffic.

The Royal Dutch Air Lines carried the Crown Princess of Sweden travelling incognito as Countess Gripsholm on Saturday last. She was booked to Malmo. The Marchioness of Milford Haven saw her off.

All the air-traffic companies report full loads, and a remarkable and gratifying feature is the large number of long distance passengers for such places as Malmo, Copenhagen, Prague, Vienna, Berlin, etc.

There have been arguments about the comparative advantages of great comfort at comparatively slow speed versus high speed without great luxury. It seems that long distance travel in Europe needs speed, and that London, Paris and other short lines may demand increasing luxury at lower speeds. Hence two distinct types of aeroplane may develop unless some of the new, big commercial types now on the stocks in various parts of Europe give both speed and luxury. The Sabena *Caproni* is looked forward to and the K.L.M. big four motored Fokker 32 also. The latter should be seen at Croydon within a month.

A. VIATOR.

HESTON

TWO and a-half years ago the British Air Navigation Co. started life with one "Puss Moth" aeroplane, as an operator of an air taxi business.

To-day the company is operating regular services to Le Touquet, Pourville, Dieppe and Deauville, in addition to a steady stream of air taxi flights all over Europe. From its "Puss Moth" upwards, the company are now running a range of machines from the fast "Percival Gull" used for rush press work to the Trimotored Ford aeroplanes carrying twelve passengers and cruising at an average of 125 miles per hour. The British Air Navigation Co. have now flown over 300,000 miles and carried more than 3,000 passengers.

IMPERIAL AIRWAYS' LATEST LINER

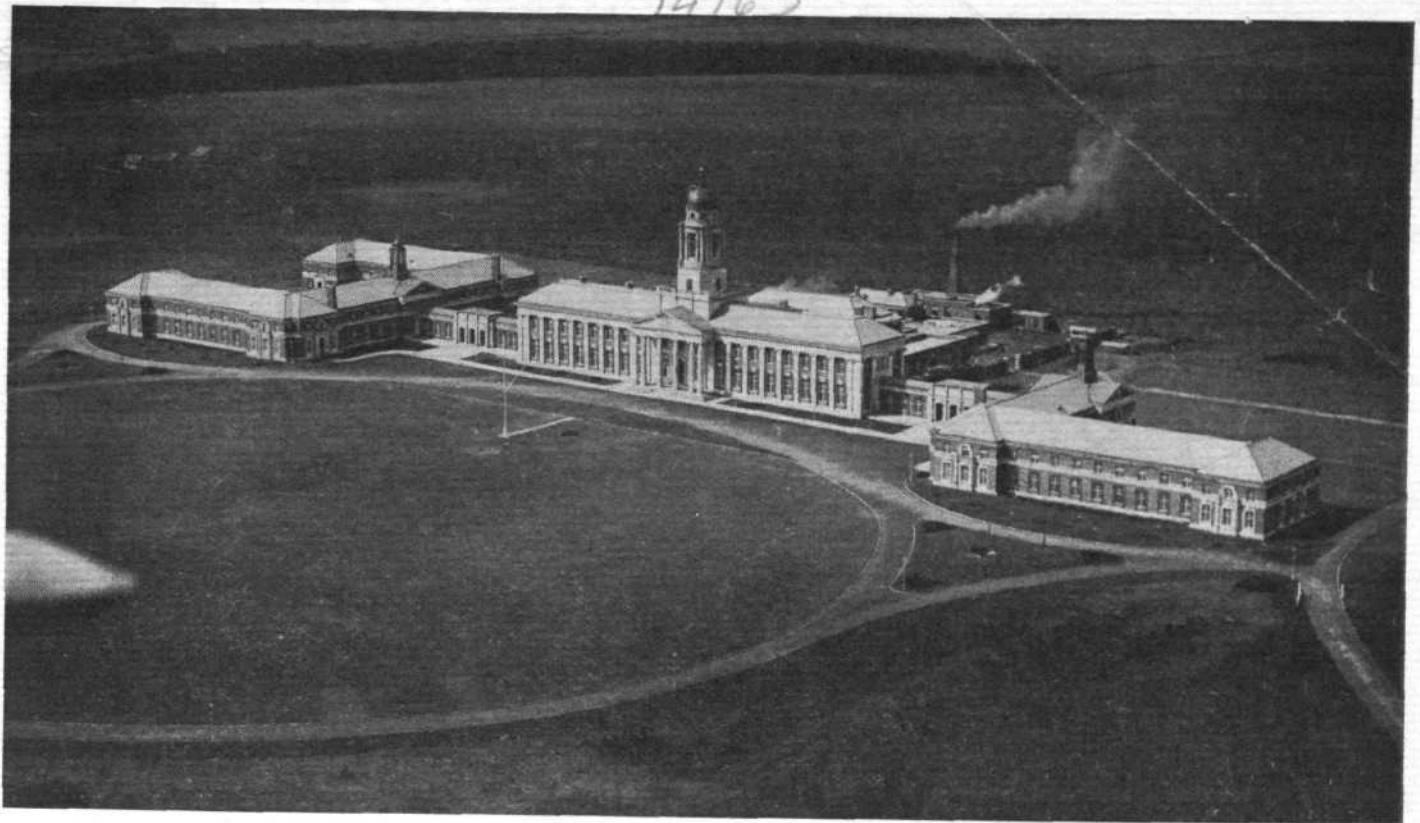
A RECENT trip to Paris in *Scylla*, the four-engined (Bristol "Jupiter") Short air liner which was described in FLIGHT for April 5, 1934, was interesting, and brought out many points wherein technical advance has been made. For example, the comfort of the passengers is greatly increased as compared with older machines, because the windows are both larger and extend above the eye line when the passenger is seated. He does not, therefore, have to bend down to look out, but can view the countryside in comfort. The upholstery now provided in air liners of this kind is certainly well up to the standard of any other form of transport. In the machine in which we flew there were only two chairs either side of the gangway and not three abreast on the starboard side, as was shown in our original description. The removal of these chairs has provided an extremely wide gangway giving a very unusual sense of airiness and consequent comfort. Moreover, it enables the steward to serve the excellent meals, which are provided by Imperials, with great ease. The noise from the four engines is certainly not undue, so that after a long journey there is no noticeable fatigue in the head due to protracted noises. Presumably the arrangement, where passengers sit with their backs "to the engine," is the outcome of Imperial Airways' experience, but, to judge from the remarks we heard, passengers prefer to face forward.

Eighteen private charter and press flights were made by Birkett Air Service during the week ending June 7. They collaborated in a fast bit of film distribution work by Gaumont-British on Derby Day. News reels were rushed from Epsom to London by motor-cycle for development, and then on to Heston, where two Birkett aeroplanes were standing by. One machine deposited films and posters (for exhibition outside the cinemas) at Southampton, Bournemouth and Bristol, and the other took supplies to Birmingham, Manchester and Leeds. In consequence, Southampton audiences were able to see the Derby news reel by 8 p.m., and others not much later. All the flights were carried out to an exact time schedule.

A COMMERCIAL AERODROME FOR EDINBURGH

EDINBURGH is at last to have a civil aerodrome, as the Aviation Department of The Scottish Motor Traction Co., Ltd., are opening a flying school at Macmerrie Aerodrome, situated twelve miles east of Edinburgh on the north side of Haddington Road. Elaborate hangars and buildings will not be erected until the Edinburgh Town Council has gone more closely into the subject of aerodromes, and decided finally whether it is possible or not to obtain a suitable site closer to their city. In the meantime, S.M.T. have opened their flying school and are already teaching a number of pupils on "Moths" ("Gipsy Major").

They are also developing a taxi service with "Fox Moths" and Avro "Cadet" three-seaters, and it is their intention, within the next few months, to station aircraft at centres like Ettrick in the Isle of Bute, St. Andrews, Dundee, etc. Flying operations of the company are under the direction of the Air Superintendent, Flt. Lt. N. M. S. Russell, and he will be assisted by Officers R. H. Soundy and C. A. Ball, other pilots being taken on as necessary. The company will be glad to have visitors to the aerodrome at any time, and no landing fees are charged. The assistance of ground engineers is available, one of whom sleeps at the aerodrome every night. In addition, of course, all the usual fuel and oil supplies, weather reports, and so forth, can be obtained.



CRANWELL

The R.A.F. Cadet College

By MAJOR F. A. de V. ROBERTSON, V.D.

Two essentials of a fighting Service are a Staff College and a Cadet College. The Royal Air Force has its Cadet College at Cranwell, Lincolnshire, and its Staff College at Andover, Hampshire. In our issue of July 20, 1933, we gave some account of Andover. The following article gives impressions formed after a visit, by kind permission of the Air Ministry, to Cranwell



CRANWELL aerodrome is familiar to most writers on aeronautical subjects. It is the largest aerodrome in the kingdom, and consequently all the heavily laden machines which have attempted to establish a long-distance record have taken off from there. The present writer was shown round the College some years ago, and brought away a recollection of dreary Army huts, which the Flight Cadets tried to make as comfortable as possible. Now, as our photograph shows, a stately building has arisen which can be seen for miles towering above the flat, wind-swept plains of Lincolnshire. It is already in use, but it will be officially opened in September next. It is a worthy home for the future permanent officers of the Royal Air Force.

A GOOD FIRST IMPRESSION:
The main entrance lobby of
Cranwell College.
(FLIGHT Photos.)



Bricks and mortar cost money, and in these still far from affluent days there are some who hold that all expenditure by the State on fine architecture is inexcusable. Solid utilitarianism, say such critics, should be the only object of building. This idea misses many points, for probably none of the arts has a greater psychological effect than architecture. It has been called the lasting expression of the spirit of an age. In any case, war-time huts will not last for ever. Sooner or later they have to be replaced. From the first it was clear that some day a proper college building at Cranwell would become a necessity, and the reasons for making it not only useful, but attractive, were thoroughly sound. Cranwell College is for Flight Cadets, young men whose ages vary from $17\frac{1}{2}$ to $21\frac{1}{2}$ years, and at that time of life things external often make a deep and lasting impression. No one with any experience denies the great influence of an *Alma Mater*, and to have its full effect an *Alma Mater* must not only be good, but must look good. Oxford stands for much that is worthy in the British race—at least, Cecil Rhodes thought so—and Oxford could hardly mean what it does if the famous High Street had consisted of rows of Army huts. Often in after life recollections of his College come back to a man with stirring vividness. The Flight Cadets of Cranwell will carry away with them, perhaps subconsciously, a feeling that they are members of a community largely devoted to mechanical science, but one in which the graces and beauties of life have a well-established place.

If the new college building is the first feature of Cranwell which demands attention, the Flight Cadets themselves must come next. The College can accommodate up to 150 cadets, but at present there are 109 against an establishment of 136. The age for entry is between $17\frac{1}{2}$ and $19\frac{1}{2}$ years. Two years are spent at Cranwell, and there are two entries each year, in January and September. That makes four terms in the course, with leave at Christmas and in the summer; but the long term is broken by short leave at or about Easter. On joining the College, the cadets are posted to one of three squadrons,

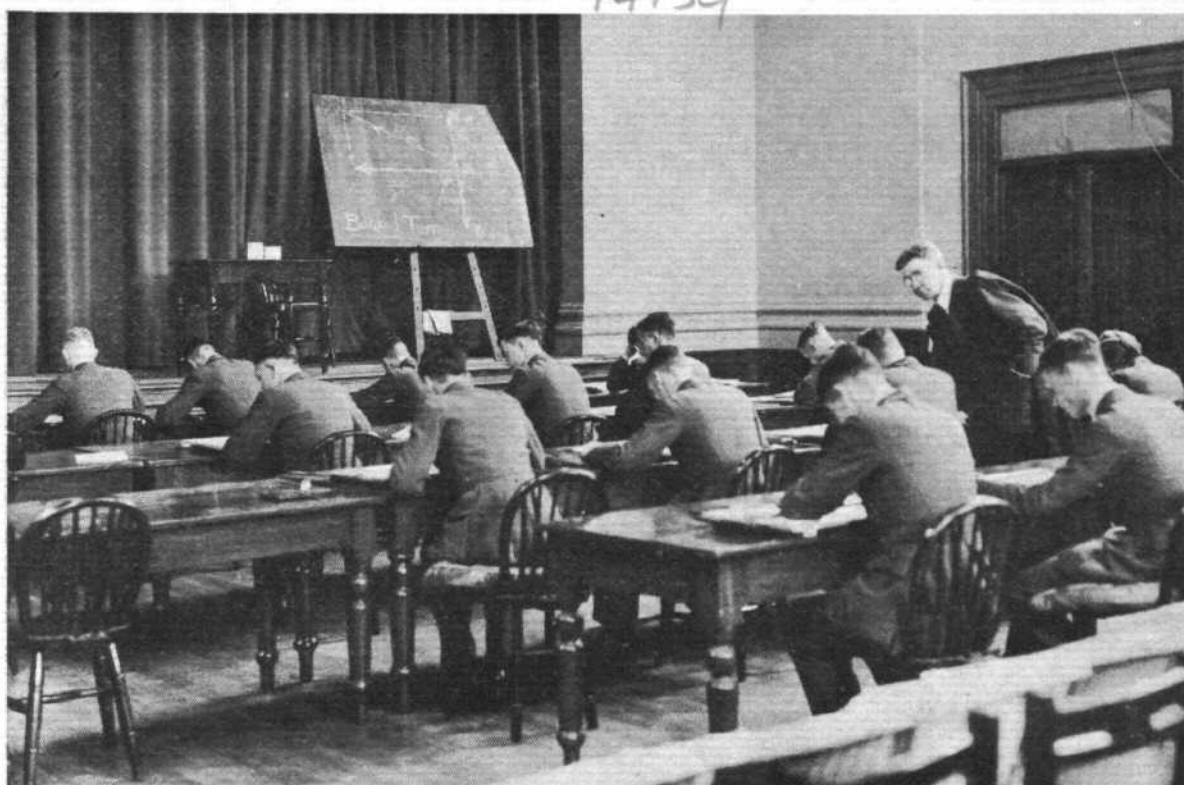


COMFORTABLE : A Flight Cadet's quarters in the new College. Before it was built, five cadets shared one dormitory and one study. (FLIGHT Photo.)

"A," "B," or "C," and each remains in his squadron for the whole of his course. These squadrons correspond roughly to the houses at a public school or the colleges at a university, though the members of the three squadrons do not live apart. Each is commanded by a squadron leader or flight lieutenant, and the system is convenient for discipline and for competitions in games. The three



THE DINING HALL : In the hall the three cadet squadrons sit at separate tables, which are adorned by the cups and trophies won in competitions. The table in the foreground belongs to a very successful squadron. (FLIGHT Photo.)



THE BIG LECTURE HALL : A class engaged in mechanical drawing. The curtains at the back hide a stage for theatricals or College lectures. (FLIGHT Photo.)

squadrons of cadets are known officially as the Cadet Wing.

For those interested in R.A.F. organisation, it may be explained that Cranwell is an independent Command. That is to say, it is under an Air Officer (at present Air Vice-Marshal W. G. S. Mitchell, C.B.E., D.S.O., M.C., A.F.C.), who is directly responsible to the Air Ministry and not to the Inland Area or any other command. The Cranwell Command includes the College, the Cadet Wing, and also the Electrical and Wireless School for aircraft apprentices, and a hospital. The College is under the immediate command of the Assistant Commandant, a post now held by Group Capt. P. Babington, M.C., A.F.C.

Parents often ask what it would cost to send a boy to Cranwell. Briefly, in the case of an ordinary Flight Cadet who is not a King's Cadet or a Prize Cadet, the fees are £100 per annum, while £100 has to be paid towards the cost of uniform and books—£300 in all. Against that may be set the pay of a cadet, 6s. 6d. a day. On receiving a commission, the cadet gets an outfit allowance of £50.

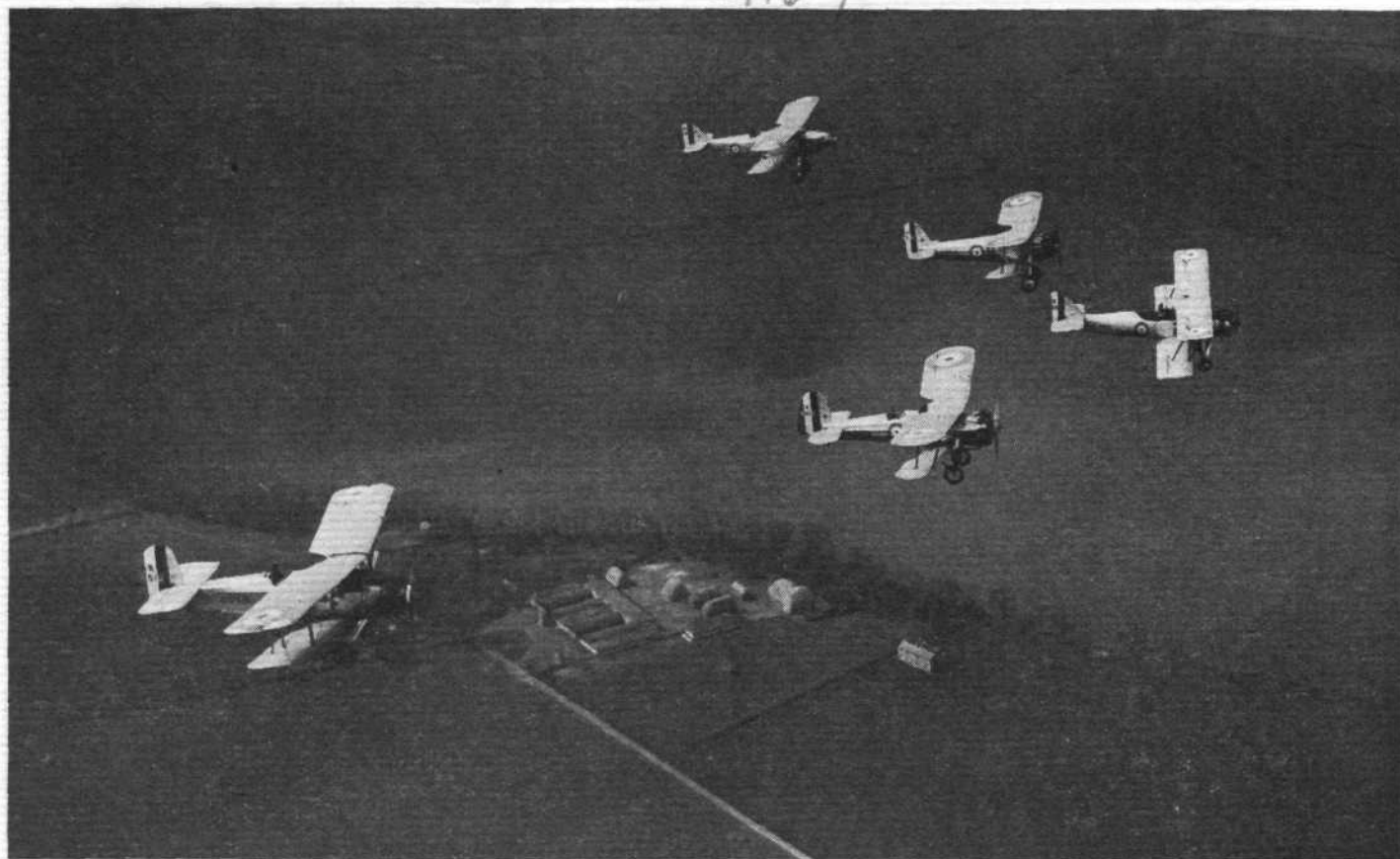
The main object of Cranwell is so to educate a Flight Cadet that he shall turn out an efficient officer. Education, of course, consists partly of instruction and very largely of other influences. The instruction at Cranwell includes teaching the cadets to fly, and that is the most popular part of the whole course. Probably at first the cadet thinks it the only part of the course which really matters. The authorities know better. Every officer must learn to fly as a matter of course, but among pilots some make good officers and others are less good. It is by Cranwell men that most of the higher posts in the Service will be filled in the future, and it

is therefore even more important to turn out good officers than to train good pilots. None the less, the flying training is as good as it can possibly be made. The cadets love it, and almost the most severe punishment which can be inflicted is to forbid a cadet to fly for so many days.

When he first enters the College a cadet is allotted to a certain instructor and is taken up as a passenger. He receives careful and thorough dual instruction until he is judged absolutely competent to go solo. That does not set him free to roam the skies at his own sweet will. After every two and a-half hours or less of solo he reverts to dual instruction, to make sure that he is not developing faults. The supervision is constant right up to the end of the course. Before he is qualified to receive his "wings" the cadet must have done a minimum of



THE LIBRARY : A very comfortable room, as a library should be, and well stocked with all sorts of books. (FLIGHT Photo.)



INSTRUCTIONAL AIRCRAFT : This picture shows five types used at Cranwell for teaching cadets to fly. The leading machine is an Avro "Tutor," followed by a two-seater "Bulldog" and a single-seater "Bulldog," with an instructional "Hart" and a two-seater "Siskin" in the rear. (FLIGHT Photo.)

70 hours in the air, dual and solo, but nearly every cadet does far more than that. Recently the average has been over 154 hours during the course, while some cadets have put in as many as 180 hours in the air. Finally, they have to pass their tests, which consist of four cross-country flights, forced-landing tests, height tests, instrument flying, aerobatics, and carrying a passenger. Very few indeed of the cadets are found unlikely to make efficient pilots. In those rare cases the discovery is usually made early, so that the cadet has plenty of time to train for another career. At the end of their course the cadets are asked to what class of squadron they would prefer to go—fighters, night bombers, flying boats, etc.—and in the majority of cases their wishes are gratified. Mostly they go straight to squadrons, but in certain cases they have to go through a course first. The flying-boat pilots go

through the course at Calshot, those for Army co-operation squadrons in India go to Old Sarum, and so on.

The flying training is the most attractive and popular part of the course at Cranwell, but on the ground the cadets have to work very hard. When one looks at the syllabus, one wonders how they get through all the subjects in a brief two years. The list of subjects is as follows:—(1) Humanistic subjects, (2) aeronautical science, (3) aeronautical engineering, (4) general service subjects, (5) flying and aeronautics, and (6) drill and physical training. Of these, aeronautical engineering is largely practical work in engine fitting and aeroplane rigging. Aeronautical science is under the care of a civilian education officer, Capt. O. S. Sinnatt, M.C., D.Sc., and includes such subjects as applied mathematics, mechanical drawing, elementary physics, aerodynamics, etc. The general service sub-



THE CHURCH OF ENGLAND CHAPEL : Acoustics are not too good in the old hangar which is used for divine worship. Note the microphones above the pulpit. (FLIGHT Photo.)

GETTING DOWN TO IT: The Flight Cadets have plenty of hard work in the workshops and rigging shed. (FLIGHT Photo.)

jects include organisation and employment of the R.A.F., Air Force law, armament, meteorology, signals, etc.

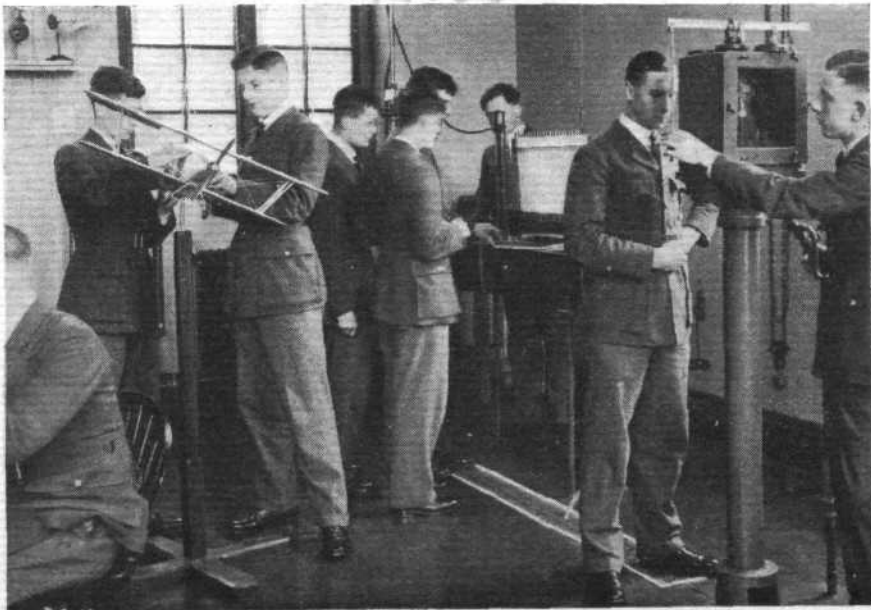
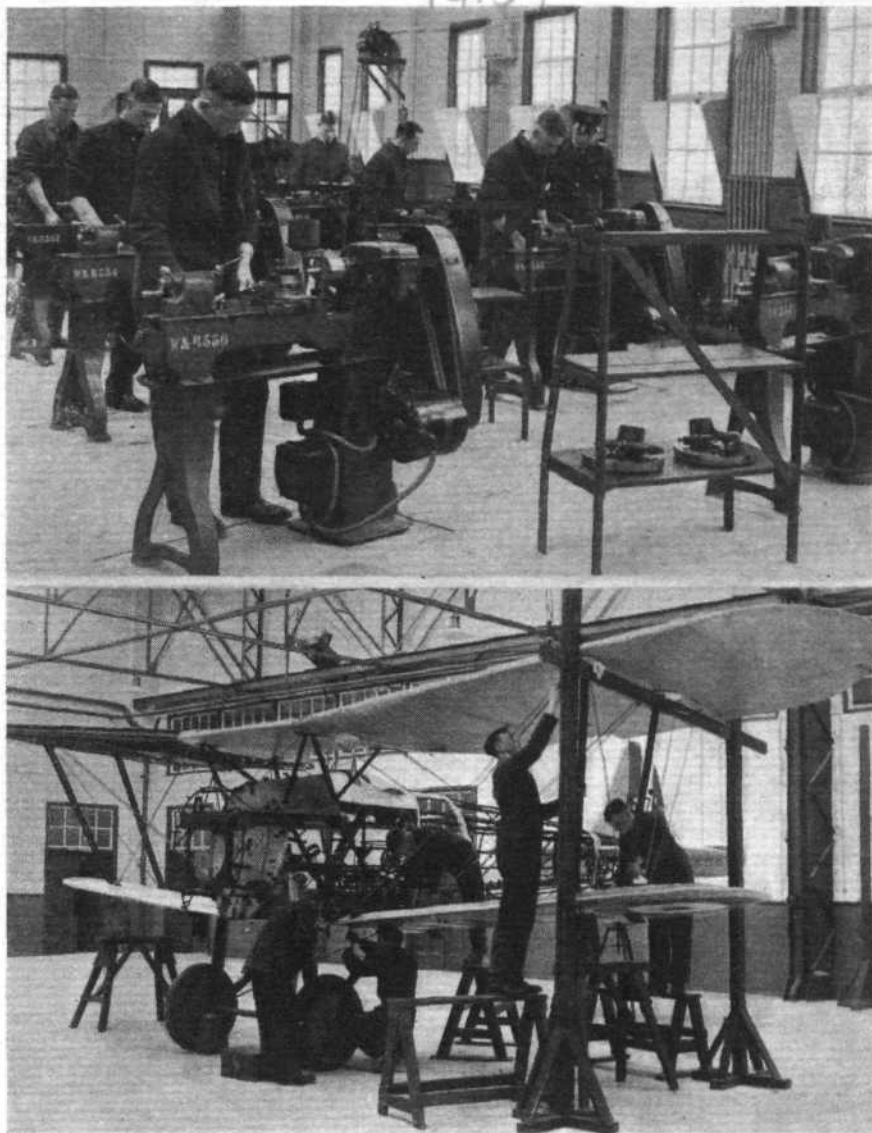
Special notice should be taken of what are called humanistic subjects. It is a cacophonous word, but what it really means is education of the mind and culture, as contrasted with instruction. This subject, too, is in the hands of a civilian education officer, Capt. de la Bère, M.A. With all the work which the cadets have to do to fit them for duty with a squadron, there is only a limited time for training their minds in other directions. Some of the home-born cadets have left school at the early age of 17½, other cadets have come from Dominions to join the R.A.F., nearly every year from six to eight come from the schools of aircraft apprentices at Halton and Cranwell, there are Indians (five at present) training for commissions in the Indian Air Force, and at times there are Iraqis and other foreigners who come to Cranwell to get the best Air Force training in the world. It is an obvious duty of the College to make provision for their cultural education. Very wisely, the subjects chosen are English and history. The history includes history of the R.A.F. and general modern history. Lectures are delivered on these subjects, discussions are held, reading is directed, and essays are written. In the last part of his fourth term every cadet has to write a thesis on some aspect of this subject. No course of study could do more, in the limited time available, to develop a cadet's powers of original thought, analysis, and criticism. And, which is important, no man who is well read in English literature and well informed on modern history can be called a badly educated man.

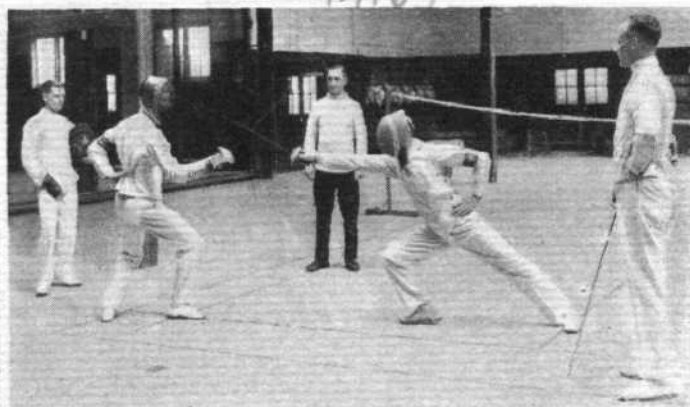
Physical fitness is of paramount importance to an officer of the Royal Air Force. All good schools nowadays recognise that team games are a most important part of education, and Cranwell takes the same view. But behind the programme of games and physical training lies the knowledge that a pilot must be in first-class health and fitness. His work in an aeroplane may tire him, but it does not exercise his muscles, and it is absolutely necessary that the man must take exercise. Therefore games are highly organised. The day starts with a colour-hoisting parade and drill. Officers must be as smart at drill as the officers of the other Services. All the regular games are played,

cricket, Rugby, Association football, hockey, etc., and the chief matches are those against Woolwich and Sandhurst. A triangular athletic contest between the three Colleges is held every year. Boxing and fencing are very popular sports at Cranwell. The station once belonged to the Royal Naval Air Service as an aeroplane and airship station, known officially as H.M.S. *Daedalus*, and the R.N.A.S. left behind them an excellent swimming bath. There is rowing on the River Trent at Newark, and some cadets keep sailing boats there. A great feature of Cranwell life is the pack of beagles, and they give great sport. Cadets who care for fox hunting are encouraged to go out with the Blankney and Belvoir hounds. One only needs to look at the cadets to see that they are a thoroughly fit lot of young men. Our photographs show something of the athletic life of the College, in particular fencing and the pack of beagles. Space forbids us to illustrate every feature of this subject.

Religious instruction is not forgotten, but the Church of England church, of which we also publish a photograph, belongs to the old order at Cranwell. It is, in fact, an old disused hangar. Inside everything possible is done to connect the building with the R.A.F. The font is an engine cowl, and inside it an old rotary engine has been adapted to hold the water. The electric lights are suspended from four-bladed propellers. Service flags and

AERONAUTICAL ENGINEERING: A class deeply engaged in mysteries. For this sort of work the Flight Cadets wear grey flannel trousers. (FLIGHT Photo.)





IN THE GYMNASIUM : Fencing is a favourite pursuit at Cranwell, and probably that is why the R.A.F. usually does so well in fencing matches against the other Services. The quickness of thought and action fostered by fencing are very useful qualities for a pilot. (FLIGHT Photo.)

banners are hung round about, and on one side of the altar is a model of the R.A.F. Memorial on the Embankment in London. There are other churches for Roman Catholics and other denominations.

A final word may be said as to the future prospects of Cranwell cadets. When they have passed out, they are given leave, and receive permanent commissions in the Royal Air Force. Ordinarily speaking, permanent commissions are only given to men from Cranwell and men who enter the Service from recognised universities. The remaining officers in the Service for the most part only receive Short Service commissions and return to civil life at the end of six years. The reason for that is that all the pilots needed cannot expect to make the Service their life's work and rise to high rank. The Air Ministry holds that there are only enough senior posts to provide for those who have entered the Service through Cranwell or a university. It follows that all the cadets from Cranwell can look forward to steady promotion up to high rank, provided that they give satisfaction at every stage of their careers. Promotion to ranks above that of flight lieutenant is by selection, but every officer who has had the advan-

tage of the training and education given at Cranwell ought to be able to go up to the top in due course without much difficulty. Every Flight Cadet carries in his knapsack the baton of an Air Marshal.

Royal Air Force Squadrons

OTHER descriptive articles concerning the work of various R.A.F. Squadrons, etc., have been published in FLIGHT as follow:—

H.M. Aircraft Carrier *Glorious*. May 16, 1930.
No. 4 (Army Co-operation) Sq., (South Farnborough); No. 17 (Fighter), (Sq. Upavon); and No. 33 (Bomber), Eastchurch. June 27, 1930.
No. 601 (County of London) (B.) Sq., A.A.F. (at Lympne). August 15, 1930.
No. 43 (Fighter) Sq. (Tangmere). September 19, 1930.
No. 2 (Army Co-operation) Sq. (Manston). December 19, 1930.
No. 101 (Bomber) Sq. (Andover). April 24, 1931.
Nos. 240 and 209 (Flying-Boat) Sq. (Mount Batten). June 12, 1931.
"1890-1912-1931." (An outline of the Growth of the R.A.F.) June 26, 1931.
Cambridge University Air Sq. (at Old Sarum). July 10, 1931.
Central Flying School (Wittering). July 17, 1931.
Submarine Aircraft Carrier "M.Z." July 31, 1931.
Oxford University Air Sq. (at Eastchurch). August 7, 1931.
No. 600 (City of London) (Bomber) Sq., A.A.F. (at Tangmere). August 21, 1931.
No. 605 (County of Warwick) (Bomber) Sq. (Cas. Bromwich). April 1, 1932.
No. 40 (Bomber) Sq. (Upper Heyford). May 13, 1932.
Nos. 7 and 58 (Bomber) Sq. (Worthy Down). June 10, 1932.
A visit to H.M.S. *Exeter* of 2nd Cruiser Squadron, Home Fleet. June 17, 1932.
Oxford University Air Sq. (Eastchurch). July 22, 1932.
Cambridge University Air Sq. (Netheravon). August 5, 1932.
No. 1 Air Defence Group (A.A.F. and Cadre Sqs.). August 12, 1932.
No. 100 (Bomber) Sq. (Donibristle). August 19, 1932.
Scotland's Auxiliaries; No. 602 (City of Glasgow) (Bomber) Sq. and No. 603 (City of Edinburgh) (Bomber) Sq. September 16, 1932.
London Auxiliaries; Nos. 600, 601 and 604 B. Sq. October 20, 1932.
No. 25 (Fighter) Sq. (Hawkinge). December 8, 1932.
No. 19 (Fighter) Sq. (Duxford). January 5, 1933.
H.M. Aircraft Carrier *Courageous*. January 12, 1933.
Lee-on-Solent. February 9, 1933.
No. 23 (Fighter) Sq. March 2, 1933.
Gosport. The Fleet Air Arm Base. March 30, 1933.
Larkhill. R.A.F. Balloon Centre. June 8, 1933.
The R.A.F. Staff College, Andover. July 20, 1933.
No. 99 (Bomber) Sq. (Upper Heyford). August 3, 1933.
No. 26 (Army Co-operation) Sq. (Catterick). August 10, 1933.
No. 3 Flying Training School, Grantham. August 17, 1933.
No. 1 (Fighter) Sq. September 7, 1933.
No. 207 (Bomber) Sq. October 12, 1933.
No. 502 (Ulster) (Bomber) Sq. November 23, 1933.
North Coates Fitties No. 2 Armament Camp. December 21, 1933.
No. 14 (Bomber) Squadron. January 18, 1934.
Calshot Seaplane Training Squadron. March 15, 1934.
No. 201 (Flying Boat) Sq. (Calshot), April 12, 1934.



THE BEAGLE PACK : The beagles are quite a distinctive feature of Cranwell life. They are handsome little hounds and show great sport. Running with them is exceedingly good for wind and limb. (FLIGHT Photo.)

VARIABLE-PITCH AIRSCREWS

EVERYONE concerned in getting a better performance out of aircraft, both civil and military, will be interested to learn that the de Havilland Aircraft Co., Ltd., of Stag Lane and Hatfield, have obtained the licence for manufacture and the selling rights for the British Empire, exclusive

of Canada, of the Hamilton Variable-Pitch Airscrew. Tooling-up for production is now being undertaken, but deliveries will not be possible for some time. It is the Hamilton type of airscrew which will be used on the D.H. "Comet," which will compete in the Melbourne air race.

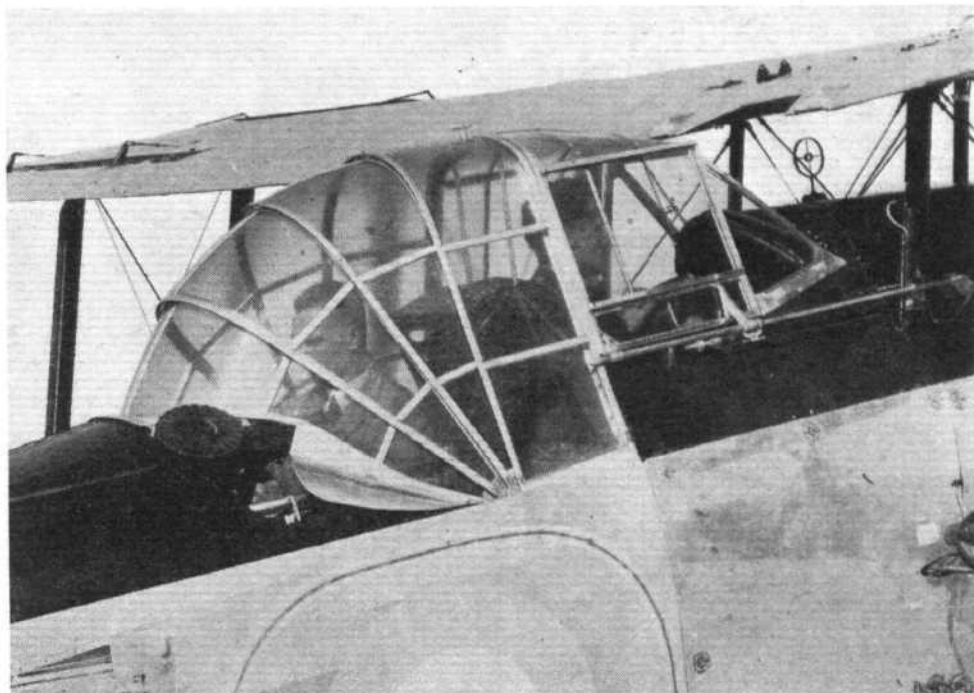
COCKPIT PROTECTION

Important Development by the Westland Aircraft Works

NOW that military two-seaters are reaching heights of about 30,000 ft. and gunners have to operate their guns at speeds round the 200 m.p.h. mark, it is obvious that neither pilot nor gunner can be completely comfortable in a conventional open cockpit. Apart from considerations of warmth for the crew, a gunner has to be protected from the air stream when standing, or he cannot operate efficiently the most carefully wind-balanced gun mounting.

Several aircraft companies have been experimenting, of late, to try to maintain reasonable comfort in Service aircraft. The Westland Aircraft Works, in particular, have done much valuable work in this direction. Experiments have been made in order to keep the occupants of the aircraft warm, first by supplying large quantities of exhaust-heated air to the cockpits, which were provided with normal windscreens. This increased the comfort somewhat at low altitudes, but if the weight of the apparatus employed was to be kept within reason, it offered little promise of success for high-altitude work. Later experiments were made in accordance with the idea that it is not so much the temperature, as the rate of change of air, which makes for discomfort, and that draught is a greater enemy to comfort than cold. After some months of development work, the Westland Aircraft Works developed the scheme of cockpit protection shown in the accompanying photographs, which is now the subject of a British patent.

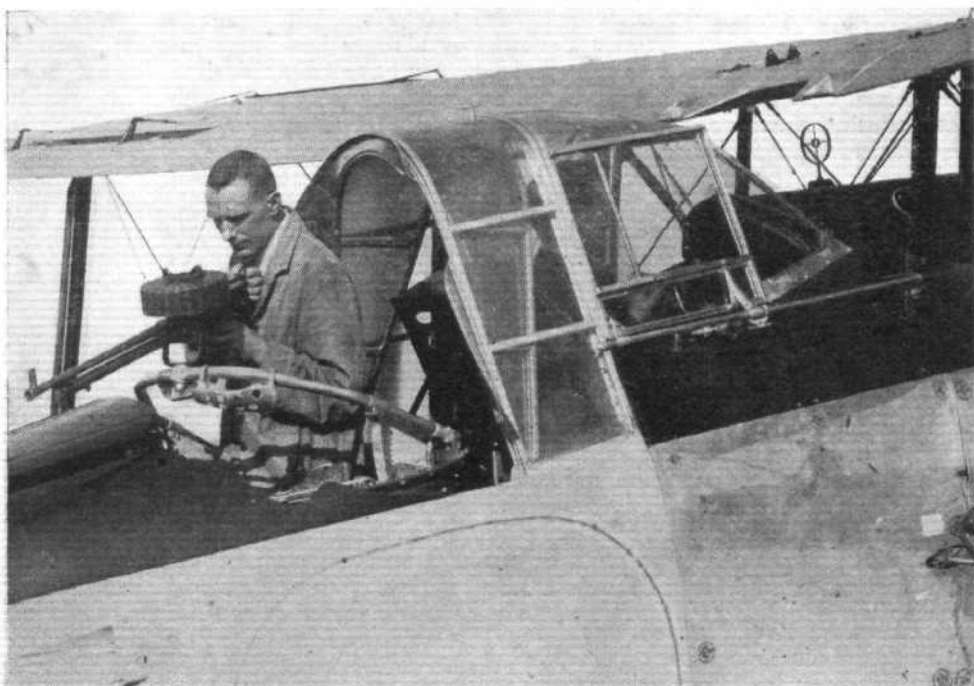
As applied to the Westland "Wallace" General Purpose aircraft, the pilot's cockpit is enclosed by a three-sided sliding coupé. This, with the fixed front windscreen and the fixed portion of the gunner's enclosure, forms a completely-shielded cockpit. Small sliding glass windows are provided in the sides of the main sliding element. For



CRUSTACEAN : The new Westland scheme of cockpit protection applied to a "Wallace."

entry and egress on the ground or in the air the pilot may slide the whole coupé forward, and in addition there is an emergency central division which allows both halves of the coupé to fall outwards when the pilot wishes to leave the machine by parachute. The gunner's enclosure is immediately behind that of the pilot. This arrangement, however, is not essential to the scheme, in fact, an alternative type, in which the gunner's protection is separate from that of the pilot, has already been fitted to another machine. However, the principle is the same, namely, that there is a fixed forward portion, roughly a section of a cylinder, the axis of which is parallel to that of the fuselage. Within this portion fold a number of hinged sectors which, when extended, completely cover the cockpit. These are metal framed and panelled with Rhodoid non-discolourable aircraft celluloid. When these sectors are down the observer, although completely enclosed, can carry out wireless, bombing or other duties in comfort, but when required to operate his gun he merely folds the sectors upwards within the fixed cylindrical portion, which, together with the pilot's coupé, provides him with what is, in effect, a large windscreen. This enables him to use his weapon in comfort at top speed.

It has been found that when cockpits are enclosed in a fashion similar to those of the "Wallace," quite a small quantity of warm air is sufficient to maintain a high standard of comfort. View, it is claimed, is considerably improved, for the waist line has been brought lower, thereby greatly improving the side, upward and forward views. It is possible then for the Lewis gun to be made to lie in a trough in the fuselage decking. Neither performance nor control are adversely affected.



CLEARED FOR ACTION : The gunner has folded away his enclosure in order to use his Lewis gun freely.

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

Prince at Display

The Prince of Wales and most of the members of the Diplomatic Corps will be present at the R.A.F. Display.

U.S. Air Increase

Plans are in hand to increase the U.S. naval air fleet by 225 machines.

Ups and Downs

The Air League has decided to fight a Bill for the preservation of the Sussex Downs, on the grounds that it will hamper the development of aviation.

London-Melbourne Cancellation

The Vicomte de Sibour has cancelled his entry in the Australian race. It is reported that his co-pilot, M. Rossi, has cabled from the U.S. saying that he will not be able to take part.

Atlantic Flyers in Rome

Lt. Com. Pond and Lt. Sabelli left Heston for Rome in their Bellanca on Monday and were welcomed at Littoria Aerodrome by the Under-Secretary for Air.

World Airways

In an article appearing in the journal of the National Peace Council, Air Commodore Fellowes remarks that . . . "Commercial aviation is the only practical field of human endeavour which presents the possibility of interweaving such a vivid mutual human interest into the life of nations as to create an international pride in a common accomplishment."

Servicing MacRobertson Racers

Foreign competitors in the England-Australia Race who do not, so to speak, know their way about the aircraft industry in England will be interested to learn that an organisation has been formed for the express purpose of looking after their machines from the time they are unshipped in this country, and throughout the race itself. Those who require such help should apply to the International Air Race Association, Bush House, London, W.C.2.



LOOKING UP THE FUNNELS: An American pilot, Len Povey, flying his special aerobatic machine on its back over Miami.

Sheffield Dallies

Progress or no progress, Sheffield still reserves its airport site at Coal Aston for housing purposes.

Twenty-five Years Ago

From FLIGHT of June 12, 1909.

"The pilot who lights a cigarette before starting, and who shifts about on his seat to improve the balance when humming through the air at fifty miles an hour, is just the sort of man that is required to show the possibilities of higher speed still. . . ."

Another Aerial Train

It is reported that a "train" consisting of an aeroplane and two gliders has flown from Moscow to Bataisk, Northern Caucasus, at an average speed of 140 m.p.h.

Engines for Germany

According to the *New York Herald Tribune*, 122 engines have been shipped from the U.S. to Germany in three months.

Miss Spicer's Distinction

By passing the examination for the Air Ministry's "B" Engineering Certificate, Miss Dorothy Spicer now has distinction as the only woman holder in the world.

An American Tragedy

The search for the Curtiss "Condor" which vanished in a storm between New York and Buffalo, has ended in the discovery of its charred wreckage in the Catskill Mountains. The four passengers and three members of the crew have all perished.

The Flying Circus

Mr. Cyril Mills, elder son of, and joint director with, Mr. Bertram Mills, has duly qualified for his certificate, and is now flying his own "Gipsy Moth" machine on work in connection with Bertram Mills' Circus.

London in the Air Age

Speaking at the Annual Dinner of the London Society, Mr. E. C. Gordon England, a Director of the Vacuum Oil Co., visualised London as becoming the world's greatest airport. He considered that the working week will be reduced to about 4½ days, and that people, flying on feeder services from London's aerodromes, will all make their homes in the country. He asked for a new conception of London utilising open spaces as aerodromes; prophesied that regular transatlantic flying would be an accomplished fact in five years, and that London would become the nerve centre of the aviation transport system of the world.



A BUSH AERODROME: Native interest in a "Gull" on Bathurst Is., N. Australia. The aerodrome was constructed under the supervision of Mr. F. X. Grell for use of any who may make the Timor Sea crossing and are in need of a "port of call."



POBJOY "NIAGARA" ENGINES FLYING: Mr. C. Gardner has had two of the Pobjoy "Niagara" engines put in his Monospar, and is now carrying out test flights for the makers. (FLIGHT Photo.)

Soviet Stratosphere Attempt

With favourable weather conditions another stratosphere attempt will be made in Soviet Russia during the coming week-end. It is hoped that an altitude of from 20 to 25 miles will be attained.

Radio Masts at Hull

Pilots are warned to look out for a group of four radio masts, 70 ft. above ground level, that have been erected at Hull (Hedon) Aerodrome, in the vicinity of the buildings on the N.W. boundary. They are marked by day with red flags and by night with red oil lamps (temporary).

Lord Londonderry's Escape

The Secretary of State for Air was involved in a mild accident at Heston last week, but, luckily, neither he nor his passenger, Mrs. Murray-Smith, was more than superficially injured. Apparently Lord Londonderry, who was flying his Avro "Cadet," realised that he was going to overshoot, opened up, and, turning to miss the trees, stalled low down.

Warning to British Pilots

The Air Ministry have asked the Automobile Association to draw attention to the fact that civil pilots occasionally infringe the regulations governing the use of cameras when flying over Italy, and in future a special note will be attached to all A.A. maps. Unpleasant consequences may follow if this warning is not heeded, for no objection will be raised to any action taken in future by the Italian authorities in the case of those who fail to observe the regulations.

Chester Airport

There is a possibility that a site at Upton, near Chester, may become the city's municipal airport.

Flying the News

As usual, copies of *The Motor Cycle* containing reports of Monday's T.T. race were flown over to the Isle of Man on Tuesday afternoon by Capt. G. P. Olley.



A MISSION FROM SPAIN: The Spanish Government has appointed a special Commission for Air Line Inquiries. They are seen here at Hatfield, and include (from left to right) Señor Escario (de Havilland Agent in Spain), Señor Oddiales, Señor Gomez Lucia, Capt. Broad, Señor A. Dellán, and Mr. Barrington. (FLIGHT Photo.)

Madagascar Air Service

A service will shortly be inaugurated between Antananarivo and Broken Hill, Rhodesia, in order to link up with Imperial Airways. Two famous pilots, Jean Assolant and Rene Lefevre, are associated with the venture.

Night Flying without Lights

Royal Air Force aircraft may be flying by night for periods of three hours, commencing half-an-hour after sunset, within the Anti-Aircraft Artillery Ranges Danger Area at Watchet until September 15. Above an altitude of 5,000 ft. the aircraft will not exhibit navigation lights, unless other aircraft are observed in their vicinity.

An Acoustic Altimeter

Working on the same principle as a sonic depth finder employed by ships, a new "echo" altimeter has been developed by a Californian professor of physics. This altimeter, of course, when perfected, would give the actual height above the ground and would be of inestimable value in blind flying.

South African Developments

Eleven wireless stations for assisting airline pilots are to be built in South Africa at a cost of £39,000. The central station will be at Roberts Heights.

Diary of Forthcoming Events

Club Secretaries and others are invited to send particulars of important fixtures for inclusion in this list:

June 16. R.A.F. Reserve Flying Club Annual Flying Display, Hatfield.
 June 23. Lancashire Ae.C. Air Display, Woodford.
 June 23. Henly Rally, Heston Airport.
 June 29. R.A.F. Twelfth Annual Dinner.
 June 30. Royal Air Force Display, Hendon.
 July 3-9. 4th International Congress for Applied Mechanics, Cambridge.
 July 7. Opening of Leicester Airport.
 July 8. French International 12-Hours Reliability Trial.
 July 8. Competition for Model Aircraft, Great West Road Aerodrome.
 July 13-14. King's Cup Race. Start and finish at Hatfield.
 July 21. Round the Isle of Wight Air Race.
 July 21-22. French Grand Prix.
 July 28. Bristol and Wessex Ae.C. Garden Party.
 July 29. London-Sherburn Race (York County Aviation Club).

Aug. 11. London-Newcastle Race (Newcastle-on-Tyne Ae.C.).
 Aug. 15. Air Tour of Italy.
 Aug. 17-Sept. 6. Copenhagen Aero Show.
 Aug. 18. Cotswold Aero Club Air Rally and Garden Party.
 Aug. 25. Liverpool and District Ae.C. Garden Party, Speke Aerodrome.
 Aug. 28-Sept. 16. International Touring Competition, Poland.
 Sep. 1-2. Cinque Ports Flying Club International Rally, Lympne.
 Oct. 6. London-Cardiff Air Race and Cardiff Ae.C. Air Pageant and Dance.
 Oct. 7. Aviation Golf Meeting, Royal Porthcawl Golf Club, Porthcawl.
 Oct. 20. England-Australia Race for MacRobertson Prize.
 Nov. 16-Dec. 2. 14th International Aviation Exhibition, Grand Palais des Champs-Elysees, Paris.

From the Clubs

Events and Activity at the Clubs and Schools

LEICESTER

Owing to the fact that the continued drought has caused a dearth of grass on the municipal airport at Braunstone, the civic authorities have decided that it would be neither wise nor safe to use the new aerodrome this year. The official opening, therefore, which had been fixed for July 7, will not be made until next year.

NORTHAMPTONSHIRE

The past week has been a very busy one, and the flying time totalled 45 hours, with two first soloists—not including those from the plovers' nests on the aerodrome.

H.R.H. the Prince of Wales landed here on Friday on his way to open the Agricultural Show at Kettering. He inspected and greatly admired the new premises, and signed the Visitors' Book. Mr. Roger Livesey, the well-known actor of the Globe Theatre, London, has joined the Club and commenced instruction. The Northamptonshire Aviation Club will shortly move into their premises on the new aerodrome.

YORKSHIRE

Eighty hours have been flown on Club machines at Yeadon during the past fortnight—on one day no less than 12½ hours were put in—and this total includes a very fair number of cross-countries. Three new flying members have joined and Mr. J. W. Rayner has purchased a "Puss Moth."

Mrs. J. R. Micklethwait, who flew her "Moth" to Austria for the Rally, has returned, after doing over 30 hours on the trip. Visitors included three Percival "Gulls," and one of these, piloted by Mr. Percival himself, and carrying Sir Harry Brittain, came up from Heston in 1 hr. 6 min.! The Club was honoured on May 26 by a visit from an R.A.F. bombing squadron, twelve machines landing at Yeadon.

SOUTHERN

The Southern Club machines have flown a total of 37 hours during the last fortnight and six new members have joined. Mr. S. Youles, incidentally, made his first solo, did his three hours' solo, and passed the tests for his licence on the same day. Mr. Westhead, who was the owner of an Avro "Cadet" fitted with wireless, has now purchased an Avro "Commodore."

On May 26 the Club organised a very successful display, which was attended by several thousand people. Mr. Cecil Pashley performed some really amazing crazy flying, and, by contrast, Mr. F. G. Miles demonstrated the safety of flying by making a "dead stick" landing on a given spot from 2,000 ft., and Mr. John Trantum made a jump, using two parachutes. In a race round a triangular course, Mr. Jack Sale just won on a "Fox Moth" from Mr. George Miles on the "Hawk." As a grand finale, a motor car was driven over the aerodrome and bombed; much to everybody's delight, a direct hit by Mr. George Miles sent it up in flames.

AIR SERVICE TRAINING

At the present moment twenty-five pupils are taking the 2½ to 3 years' course at Hamble, and there are, in all, fifty-five resident civilian pupils. The rapid growth of the school is shown by the fact that during the same month in 1932 and 1933 there were nineteen and twenty-four pupils respectively.

During the past month a total of 830 hours was flown, and the increase has necessitated the addition of two more Avro "Cadets," bringing up the total of this type alone to thirteen.

In common with other flying centres, the school was open for inspection on Empire Day, and two thousand people arrived, in spite of counter attractions. No change was made in the school curriculum, and visitors were thus able to see work under normal conditions, though a flying display was arranged and free flights given.

The final squash match of the season, which was played at Hamble against Mr. P. Q. Reiss's team, resulted in a draw, the score being 3—3.

CAMBRIDGE

Marshall's Flying School had an exceptionally busy month during May, the flying times being 45 per cent. higher than those of the corresponding month last year. A total of 55 hours was flown last week, including licence tests by Lts. Bell and Greenwood, and one first solo.

Señor J. de la Cierva demonstrated the C.30 before a large crowd on June 8, and many machines visited Cambridge for May week.

SOUTHEND

Without any Government subsidy the Southend Flying Club, due in a great measure to the enthusiasm of Councillor G. Weber and to the keenness of those associated with him, is going along well. During the last two weeks over eighty flying hours have been recorded at the Rochford Aerodrome—better than any previous record, and a "Fox Moth" has been added to the fleet.

Mr. W. Glover, the instructor, has 17 pupils, including two ladies, under instruction. Evening week-end trips to other aerodromes are now proving very popular.

An amusing incident occurred on a trip for Messrs. Ekcos' to Leeds and Northampton. In poor visibility a compass course was being flown, but instead of going "as the crow flies" the pilot discovered his progress was "as the crab walks," and observation showed his compass to be 30 degrees out. A landing was deemed necessary to locate the trouble, which proved to be a wireless set with a powerful magnet stowed in the cabin beneath the compass box—unbeknown to the pilot, Mr. Glover.

HATFIELD

Further details of the R.A.F. Flying Club Display next Saturday prove that the show will be even better than was expected. Instructors from A.S.T. will give demonstrations of inverted flying, the "Gauntlet" will be demonstrated by F/O. P. E. G. Sayers, and the "Hart" by Flt. Lt. P. W. S. Bulman, "eccentric aerobatic" turns will be given by the instructors of the D.H. School, the latest Autogiro will be put through its paces, and there will be flight aerobatics by No. 1 (Fighter) Squadron—which, incidentally, is shortly proceeding to Toronto for the celebrations.

H.R.H. Prince George should land at Hatfield at 4 p.m.

Six new members have joined the London Aeroplane Club during the week, but owing to high winds, flying has been rather reduced, the total being 57 hours. Mr. Lipton, a member of the Club, has entered his "Gipsy III Special Moth" in the King's Cup Air Race.

The two hard tennis courts are now ready for play. These are Championship courts, laid down by the En-Tout-Cas Co., Ltd., and similar to those installed at the Aldenham and Queen's Club.

LANCASHIRE

On June 3, Club machines took part in hostile action against the 42nd Divisional R.A.S.C. (T.) Transport engaged in their annual manœuvres. Seven members took part, and, after locating the convoy of heavy motors on the moors, dropped message bags, and "shot up the troops." Later, a second attack was launched.

Capt. Placido da Cunha Albreu, of the Portuguese Air Force, has been stirring the air over Woodford recently, while practising for the international aerobatic competition, held in Paris. Amongst other illustrious visitors to the Club were Mr. Woodfull, the captain, and some of the Australian Cricket Team.

The Club's energies are entirely devoted to preparations for the Air Display at Woodford on June 23, and this will be, undoubtedly, the largest enterprise of its kind which Manchester has ever had the opportunity of witnessing. The Royal Air Force are co-operating and, incidentally, showing the flag in a district where many taxes are paid but few R.A.F. machines are seen. Sir Alan Cobham is giving us his organised display, and there will be an Inter-Club Air Race with prizes of £25, £10 and £5. Visiting pilots will be cordially welcomed, and are especially asked to endeavour to arrive before 1 p.m.

READING AERO CLUB "AT HOME"

A demonstration of new aeroplanes, and of festive hospitality

ABOUT thirty private owners flew to an "At Home" at Reading aerodrome on Saturday last. The arrival competition was won by Mr. "Bats" Page, of Brian Lewis & Co., Ltd., who arrived one minute before the appointed time. Mr. Saunders, flying his "Martlet" ("Genet"), gave an aerobatic display to open the programme; a fine display by Flt. Lt. Turner Hughes in an Avro "Tutor" ("Lynx"), which the announcer insisted on calling either an Armstrong-Whitworth or an Armstrong-Siddeley aeroplane, followed. Flt. Lt. Turner-Hughes showed admirably the aerobatic qualities of the "Tutor," and included a large amount of inverted flying in his programme. Mr. Piper, now touring with the Short "Scion" (two Pobjoys), then demonstrated this machine, which looks very handsome in two shades of green. Mr. Piper proved the ability of the machine to fly with one engine throttled back and also its slow landing speed.

The latest Percival "Gull," with a "Gipsy Six" engine, was demonstrated by Mr. Lumsden. A top speed of about 170 m.p.h. is claimed for this model. Mr. Page, of Brian Lewis, showed off a "Moth Major" ("Gipsy Major"). One of the most impressive events of the day was given by Mr. Bailey in a Blackburn B.2 ("Gipsy III"). He indulged in some crazy flying and advanced aerobatics on this machine, which has side-by-side seating. On coming in to land he purposely dropped it on to the ground from quite a height, producing a dissenting grunt from the undercarriage and a shudder from every ground engineer on the aerodrome.

At about tea time the "Harts" of No. 600 (City of London) (Bomber) Squadron, A.A.F., appeared and flew to and fro across the aerodrome in various formations. The Squadron concluded its display with a cautious power dive. Three other demonstrations were given before the meeting closed, by Mr. Hordern on a British Klemm "Swallow" (Pobjoy), Mr. Brie with an Autogiro C.30 P. (7-cyl. "Genet Major"), and by Mr. Percival on the "Mew Gull" ("Javelin"). The British Klemm often gave us the impression that it was flying almost as slowly as is possible with an Autogiro, but when Mr. Brie demonstrated the latter aircraft we were assured that it was in a class of its own in this respect. The "Mew Gull" was the centre of attraction, but Mr. Percival saved his demonstration of this machine until he took-off to fly home. Time and time again he shot across the aerodrome at terrific speed, the machine a streak of white against a background of dark green trees.



ZONK! *Ruddy Duck* was the name given to the first Phillips & Powis School "Hawk" at Reading by Mrs. Miles last Saturday.

Mrs. Miles christened a very smart red "Hawk" and Mr. Miles later demonstrated the machine, which is the first of its kind to be supplied to the Club. Mrs. Battye's cocktail bar did well, and Lord Northesk auctioned all unconsumed refreshments.

A BROXBOURNE OCCASION

ACTIVITY at the Herts and Essex Club has increased to such an amazing extent that enlargements and extensions have been necessary in all directions. One new "Hawk" has been added to the fleet; the aerodrome is being extended to the north-east, the clubhouse has been enlarged to twice its original size, and this last was suitably celebrated last Thursday by a supper-dance and entertainment.

At 10 o'clock two hundred people had assembled in the new club room, and Mr. S. A. Perrin, the chairman of the Pilots' Advisory Committee, presided at a very pleasant but short opening ceremony. He referred in reminiscent mood to the early days of the Club, founded by the brothers Roger and A. R. Frogley and by "Teddy" Darlow, now respectively chief instructor, managing director, and secretary. From very small beginnings the club had grown beyond all recognition, a fact that was in no small measure due to the enthusiasm of the first members, which had persisted until the present day without decrease in intensity. He then gave figures showing the increase in membership and flying times, a short study of which proved conclusively that the present extensions were absolutely imperative.

Mr. Kenneth J. Lindy, a pilot-member of the club and the architect responsible for the extensions, then followed

with a short description of the building. The centre of the clubroom floor was laid down with a special composition which could make an excellent dance floor, the platform with sounding board was ideal for a dance band or lecturer, and the accommodation was now adequate to deal with at least two hundred people. The club house now contained a large clubroom, restaurant, kitchen, seven bedrooms, bathroom, billiard room (with a full-sized table), and bar.

Afterwards Mr. J. A. Mollison was called upon by the chairman to perform the opening ceremony. He stated that he had had a very pleasant association with the club, and that he was delighted to have been asked to perform such an important duty, one which evidenced so strikingly the progress which the club was making.

The chairman then pointed out a very handsome silver challenge trophy which had been presented to the club by Mr. and Mrs. Mollison, and remarked that this would be competed for during July, the subject being aerobatics. Finally, Mr. Victor A. Ercolani voiced the opinion of the members in expressing their gratitude to Mr. and Mrs. Mollison for coming along, and to Mr. Mollison for performing the opening ceremony, and Mrs. Mollison replied.

Dancing proceeded until 1 a.m. to the excellent music of Ernest Rutherford's Band, and was interspersed at intervals by entertainment.

MIDLAND

The flying times for the week were: dual 21 hr. 10 min. and solo 23 hr. 50 min., including one first solo by Mr. R. Young. Two new members have joined the Club.

BROOKLANDS

Flying time during the past week has amounted to 89 hours, and five new members have appeared. Nearly four thousand people were present at the Garden Party.

B.A.C. IN BELGIUM

At the Ghent Gliding Club, Pupils Graduate from Gliders to B.A.C. "Drones"



The Belgian B.A.C. "Drone" on a sharp turn.

USING a very slightly modified edition of the B.A.C. "Drone," with a Douglas engine, a Belgian gliding club has developed an interesting and extremely inexpensive form of flying for its members. No actual dual is given by the instructor, M. Henri Manchoulas, who, it may be remembered, recently flew from Ghent to Le Bourget in a "Drone," and who is a war-time pilot.

Pupils are started in simple gliders, which are towed by an ingenious form of motor-driven winch gear (in which an increasing virtual diameter of the cable drum increases the speed of the glider as the tow length increases), learn at first to use the controls and then to do straight flights. Afterwards they graduate to more efficient gliders, learn to make gliding turns and accurate approaches, and are finally sent off on the "Drones" with the certain knowledge that they are capable of any form of difficult approach without the use of an engine.

The Section Gantoise de Vol Sans Moteur, as the club is called, is a purely amateur affair, and this, combined with the fact of the low cost of the flying, has meant that the cost to the pupil is as small as 15s. per hour at the present rate of exchange. Development work has been carried out by M. Jacques de la Croix and the club has been assisted in a number of ways by local notabilities and by the Government.

Some form of Certificate of Airworthiness had, of course, to be obtained for the "Drones," which, because of their comparatively low speed of climb, cannot obtain any but a special one. Through various good offices, the club obtained a special C. of A. for the "Drone," for which it is known as an "extra lightweight single-seater," and for which the requisite figures are:—Maximum weight, 333 kilog. (734 lb.); maximum engine capacity, 1,000 c.c.; maximum wing loading, 20 km. per sq. m. (4.1 lb. per sq. ft.); obstacle 15 m. (49 ft.) high must be cleared after 600 m. (1,968 ft.), and minimum climb is 150 m. (492 ft.) in 3 minutes. The factor of safety is that applied to touring aeroplanes in Belgium—seven.

A LIGHT PUSHER MONOPLANE

Details of an Interesting little Machine with a Pobjoy "R" Engine built in Batavia

UNUSUALLY good performance figures are quoted for a light monoplane built by the Walraven Company at their works at Bandoeng, Batavia, Dutch East Indies. The machine has a Pobjoy "R" engine arranged in a nacelle on "stilts" above the fuselage, and both the view and the comfort for the two occupants should be good.

Mr. H. G. Shaw, of Shell-Mex & B.P., Ltd., who saw it during his tour to Australia, speaks of it as an extremely smart as well as practical aeroplane. The data given are as follows:—

Length, o.a.	20.7 ft. (6.3 m).
Wing span	30.5 ft. (9.3 m).
Weight with two passengers	1,100 lb. (525 kg).
Top speed	121 m.p.h. (195 km/hr).
Landing speed	46 m.p.h. (75 km/hr).



HANWORTH'S FATE

It is reported that the Middlesex County Council have decided to tender for the Hanworth Park Estate. This announcement suggests that Hanworth Aerodrome may thus become the Middlesex County Aerodrome, and in this case it seems likely that the flying club and operation of the aerodrome may be handed to one of the established firms. Heston is already finding that their commercial traffic is so great that strict aerodrome control is necessary, and the experience at Croydon shows that instruction at a controlled aerodrome cannot be carried on entirely successfully. We should not be surprised, therefore, to see the club and instructional work of Airwork, Ltd., at Heston, transferred to Hanworth as soon as the fate of the aerodrome is settled. The two aerodromes are only some three miles apart, far enough to prevent the traffic at one affecting that at the other at all seriously, but close enough to enable close co-operation to be maintained. Club members at Hanworth are putting in a lot of time in the air and ten hours' flying instruction each day is a common total.

PASSENGERS SAFETY

A WELCOME addition to the Air Navigation Order is contained in the Air Navigation (Amendment) Order, 1934. This is to the effect that it is incumbent upon the person in charge of an aircraft which is being used for trick or exhibition flying, when carrying passengers for hire or reward, to satisfy himself, before commencing each flight, that every passenger carried in an open cockpit and the pilot, or pilots if more than one is carried, is properly secured by the prescribed safety belts. Apparently, therefore, the person in charge of flying at air displays or circuses, must not only see that his passengers are strapped in, but also that his pilots have got their belts done up; we should have thought that the pilot himself was in charge of the aircraft under those conditions. Anyhow, somebody has got to do it, that is the main point. Far too much risk has been taken in the past by pilots aerobating passengers when they were not strapped in at all. Even now there seems to be nothing against anyone taking up passengers and dropping them on to the cabin roof by hanging on the top of a loop!

FOREIGN AIRCRAFT



AMERICA'S FLEET FIGHTER : The Boeing F4B-4 with supercharged Pratt and Whitney "Wasp."

BOEING SINGLE-SEATER FIGHTERS

A Successful range widely used in the U.S.A.

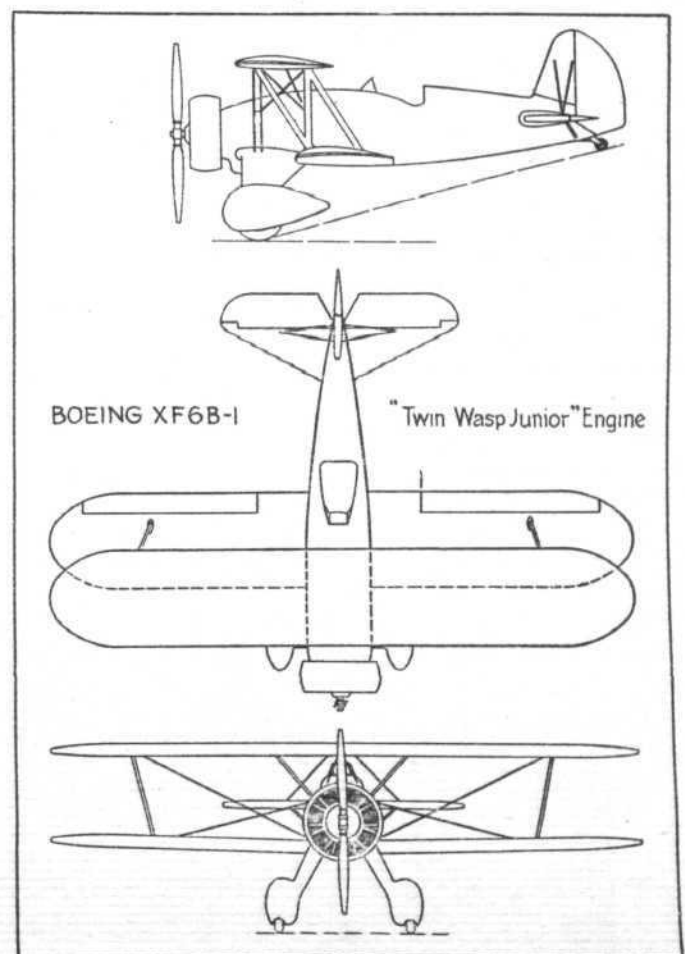
BOEING fighters to-day form the greater part of the standard fighter equipment of the U.S. Army Air Corps and U.S. Navy. Two types are mainly used, the P-12E and P-12F by the Army, and the F4B by the Navy. When a fighting aircraft is used by the U.S. Army Air Corps it is known as a "pursuit" machine, but when used for naval duties it is classed as a "fighter." The P-12 and the F4B designs are basically similar. A parallel case exists in our own Air Force, the "Nimrod," our standard Fleet Fighter being developed from the "Fury," one of our standard land fighters. But while the "Nimrod" has been considerably modified for operation from aircraft carriers, even to the extent of being fitted with larger wings, the overall dimensions of the two Boeings remain approximately the same.

We are particularly concerned here with the F4B-4 machine. While classed as a single-seater fighter, the machine is used also for light "dive bombing" work when it carries two 116-lb. bombs. The wings consist of two built-up box spars of spruce and plywood, with wooden Warren girder-type ribs. Frise ailerons, of duralumin construction, covered with corrugated duralumin sheet, are used, being fitted only to the top planes. Flotation gear is carried in the top planes.

Welded chrome-molybdenum steel tubular construction is

used for that portion of the fuselage forward of the front lower wing spar. Aft of this the fuselage is a duralumin semi-monocoque structure. The tail unit is of metal construction, the members being covered with corrugated duralumin sheet. The undercarriage is of the cross-axle type using Boeing oleo legs. A steel tube Vee, with its "apex" at the centre of the cross axle, takes the side loads.

A supercharged Pratt & Whitney "Wasp" engine of



EXPERIMENTAL : The Boeing XF6B-1 single-seater fighter ("Twin Wasp Jnr.") developed from the F4B-4.

BOEING F4B-4 Pratt & Whitney "Wasp"

DIMENSIONS

Span (top)	..	..	..	30 ft. (9.13 m)
Span (lower)	..	..	..	26 ft. 4 in. (8.02 m)
Length	..	..	..	20 ft. 5 in. (6.2 m)
Height	..	..	..	9 ft. 9 in. (2.9 m)
Wing area	..	..	..	227.5 sq. ft. (21.1 m ²)

WEIGHTS AND LOADINGS

Weight empty	..	..	..	2,301 lb. (1,045 kg)
Disposable load (Fighter)	..	..	..	714 lb. (324 kg)
Disposable load (Bomber)	..	..	..	1,045 lb. (474 kg)
Weight loaded (Fighter)	..	..	..	3,015 lb. (1,369 kg)
Weight loaded (Bomber)	..	..	..	3,356 lb. (1,524 kg)
Wing loading	..	..	..	13.25 lb./sq. ft. (64.6 kg/m ²)
Power loading	..	..	..	6.03 lb./h.p. (2.7 kg/h.p.)

PERFORMANCE (FIGHTER)

Speed at sea level	..	..	..	167 m.p.h. (267.2 km/hr)
Speed at 6,000 ft. (1,830 m)	..	..	..	187 m.p.h. (299.2 km/hr)
Landing speed	..	..	..	61 m.p.h. (97.6 km/hr)
Climb to 15,000 ft. (4,575 m)	..	..	..	9.5 min.
Service ceiling	..	..	..	27,500 ft. (8,388 m)

approximately 500 h.p. is usually fitted, while a two-bladed metal airscrew and low-drag cowling are standard. The main fuel tank of 55 U.S. gallons capacity is in the fuselage, but another tank of equal capacity may be slung beneath the fuselage, from which position it may be dropped during flight.

Normally the armament consists of two 0.30 calibre Browning machine guns mounted in front of the pilot and firing in troughs in the top fairing, or one 0.30 and one 0.50 calibre gun. In the former case 600 rounds are carried for each gun, but when the 0.50 gun is used it is provided with only 200 rounds. Complete wireless receiving and transmitting equipment is carried, the mast being mounted aft of the pilot's cockpit.

From all reports the machine is of exceptional sturdy construction and is highly manoeuvrable. Recently nineteen F4B-4's made a mass-formation flight from Quantico to Guantanamo Bay, Cuba, a distance of about 5,000 miles. This included 800 miles over water and 3,000 miles over tropical country.

FOR AEROBATICS

The Breda 28 used at the Vincennes Meeting by Colombo

BUILT solely for "aerobatic" flying, the Breda 28 is an extremely manoeuvrable aeroplane of very sturdy construction. It has obviously been developed from the Breda 25 and 26 training machines which are widely used in Italy. The machine is a biplane of mixed construction with wings of biconvex section. The factor of safety is the same for both normal and inverted flight.

Welded steel construction is used for the fuselage, which has been statically proved before and after diving at 312 m.p.h. Every part can be rapidly exposed for inspection and adjustment of controls. All control surfaces are aerodynamically and statically balanced, and the empennage is of the monoplane type in which biconvex section is used for the tail plane. The control system is duplicated throughout and the tail plane is adjustable during flight. An unusually wide undercarriage of the split type, the wheels of which are fitted with brakes, is used.

BRED A 28			
Piaggio 380 h.p. Radial Engine			
Dimensions			
Span	..	..	32 ft. 9½ in. (10 m)
Length	..	..	25 ft. 7 in. (7.8 m)
Height	..	..	11 ft. 1 in. (3.37 m)
Wing area	..	..	323 sq. ft. (30 sq. m)
Weights			
Weight empty	..	..	3,116 lb. (960 kg)
Useful loading	..	..	529 lb. (240 kg)
Gross weight	..	..	2,645 lb. (1,200 kg)
Wing loading	..	..	8.19 lb./sq. ft. (40 kg/m²)
Power loading	..	..	6.75 lbs./h.p. (315 kg/h.p.)
Performance			
Maximum speed	..	..	149 m.p.h. (240 km/hr.)
Minimum speed	..	..	46 m.p.h. (75 km/hr.)
Cruising speed	..	..	124 m.p.h. (200 km/hr.)
Climb to 16,400 ft. (5,000 m)	..	..	16 minutes
Surface ceiling	..	..	24,600 ft. (7,500 m)
Take-off run	..	..	263 ft. (80 m)

A Piaggio 7-cylinder radial engine giving 380 h.p. at 2,000 r.p.m. and weighing 682 lb. is fitted, employing a carburettor of a special Piaggio type suitable for inverted flying. The fuel pump is of the Lamblin Corbetta type with a pumping capacity of 31 gallons per hour. An oil pump is also fitted for inverted flying. Petrol and oil tanks use flexible tubing hanging in such a manner as to maintain a constant supply to the pumps, and are provided with double breathing to ensure the re-entry of air in any position. The double circulation of petrol for normal and inverted flight is controlled by the pilot.

THE GRUMMAN XJF-1

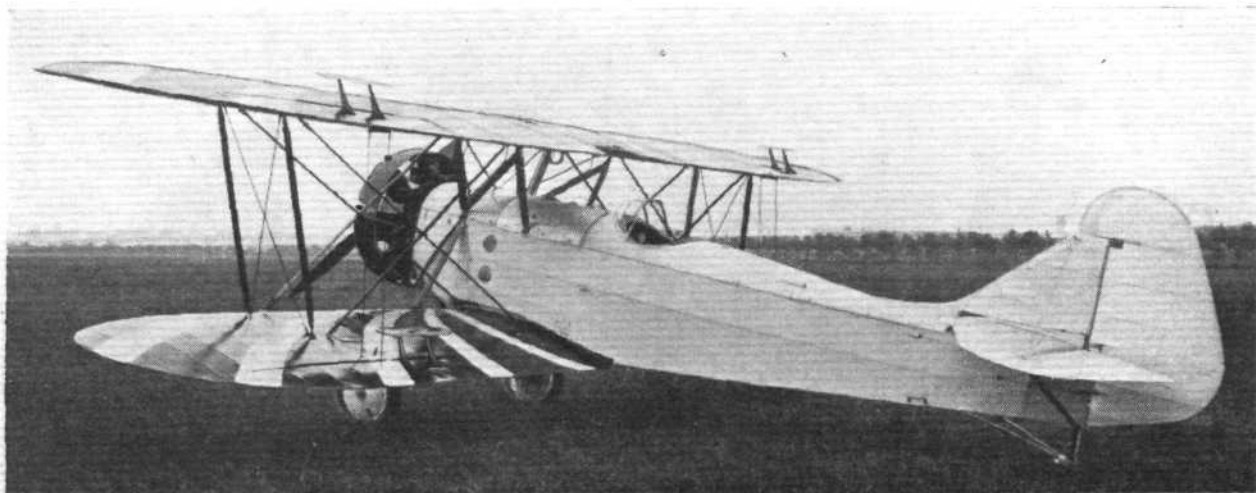
A Fast American Amphibian

IN FLIGHT of May 10 we illustrated the Grumman F.F.1 two-seater fighter (Wright "Cyclone F"), fitted with retractable undercarriage, and referred at the same time to the amphibian landing gear which has been developed by the Grumman Corporation for the U.S. Navy. This concern has now produced a fast new two-seater amphibian for



A FAST AMPHIBIAN: The Grumman XJF-1 two-seater for the U.S. Navy.

the U.S. Navy with the type number XJF-1. A Pratt & Whitney engine of about 700 h.p. is fitted. One would deduce from the photograph that this is of the two-row type. It is probable, in fact, that it is a "Twin Wasp Junior," an engine which is becoming very popular in the U.S.A. for installation in high-performance Service aircraft. N.A.C.A. cowling and variable-pitch airscrew are used. A central float is mounted in rather a similar fashion to that of the Keystone amphibian of a few years back. The machine should be an admirable aircraft for scouting work from cruisers and other naval vessels fitted with catapults, owing to its compactness. Central-float seaplanes have been favoured by the U.S. Navy for this work for some years past. In this country the type has not proved so popular, but two or three years ago the Short "Gurnard" two-seater Fleet Fighter Reconnaissance machine was converted into a central-float amphibian. The span of the Grumman is 39 ft. (11.89 m), top speed 168 m.p.h. (271 km) and service ceiling 18,000 ft. (5,500 m).



BUILT FOR THE JOB: The Breda 28 "aerobatic" machine.

INTERNATIONAL INSURANCE

Many of the difficulties of foreign air travel will be removed now that an International Union of Aviation Insurers has been formed

CAPT. A. G. LAMPLUGH was, on June 4, elected the first president of the newly-formed International Union of Aviation Insurers. Capt. Lamplugh has been called the "King Pin" of British aviation; he is certainly that, and a great deal more as well. In his position as underwriter and principal surveyor of the British Aviation Insurance Company, he has done an enormous amount to place civil flying on the firm basis it now enjoys. Furthermore, he has won for himself the greatest esteem and respect among those who fly, both in this country and abroad.

The Insurance Union which has now come into being will be the means through which questions of international law will be settled, and also all those arising from the fact that the fast aeroplanes in use nowadays often cross many frontiers in the course of a single journey. The consequent risks may involve serious underwriting hazards, and these may require the co-operation of several national insurance companies. The arrangements for the grant of

insurance, for the issue of certificates, covering third-party risks in different countries, for assessing and settling claims and for the safeguarding of damaged aircraft with a view to salvage are other points making international co-operation essential. The present proposal to create an International Union was originally made by Capt. Florman, of A.B. Aerotransport, the Swedish operating company.

The main idea is that a central office should be established in London, for the first year at least, and that the duty of the staff should be to compile and circulate information among the members of the Union, to convene meetings when important matters arise for discussion, and, generally, to further the mutual co-operation and goodwill without involving the elimination of fair competition.

The objects of the International Union were described by Lord Wakefield, President of the British Aviation Insurance Company, at a dinner given at the Savoy Hotel on June 4, at which Sir Arthur Worley, Chairman of the same company, presided.

F.A.I. CONTEST COMMITTEE

Meetings Held in Paris

THE International Contest Committee of the *Fédération Aéronautique Internationale* met in Paris on May 24, and the International Air Tourist Committee on May 25. These meetings were followed by a session of the General Council of the F.A.I. at the Aero Club of France on May 26.

The session of the General Council was opened by Gen. Denain, the French Air Minister, while Prince Bibesco, the President of the F.A.I., was in the chair. Sixteen countries were represented. The gold medal of the F.A.I. for the best performance last year was awarded to Wiley Post for his flight round the world in approximately eight days. A new and more practical form of *Carnet de Passage en Douane* was approved. The Contest Committee authorised the following places as those between which record flights could be established:—London-Melbourne, Washington-Havana, Washington-Mexico City. Warsaw was added to

the list of capitals from which records of at least 2,000 km. (1,243 miles) could be established. Regulations governing the Gordon-Bennett balloon race, to be flown from Warsaw on September 23, were approved. It was decided to hold the next General Convention of the F.A.I. at Washington on October 8, with Mr. Mitchell Carroll as reporting secretary; to establish the same category of records for light amphibians as now exist for light seaplanes; and, on application from the Aero Club of Italy, that members of a National Contest Committee could act as field judges, but after their having done so they could not sit as arbitrators in the case of objections being made by contestants.

Many other questions concerning matters such as the timing of speed flights, the requirements of record flights round closed circuits, and the installation of a meteorograph for checking altitude record flights, were referred to the forthcoming Washington Convention.

Two Special R.A.F. Display Numbers of **FLIGHT**

JUNE 28th—R.A.F. Display.

THIS will be a considerably enlarged issue, and among other special features will contain informative notes about the various types of service aircraft in the Display, some observations upon their special duties, the work of the various squadrons and details of their training.

Also Commercial Aviation, Airlines, Airports, Private Flying and Notes & News of the Week.

Copies of this number will be on sale in the enclosures at Hendon.

JULY 5th—S.B.A.C. Exhibition.

Report of R.A.F. Display.

THE second of the "FLIGHT" special issues will contain among other features—

An illustrated review of the aircraft and equipment at the exhibition at Hendon arranged by the Society of British Aircraft Constructors.

The R.A.F. Display Report written by the staff of "FLIGHT" and illustrated with exclusive pictures by the journal's photographers.

This issue will constitute a dependable and informative record of these events particularly valuable to those who are unable to visit Hendon.

Definite orders for these special numbers of "FLIGHT" should be placed with newsagents and bookstalls.

THE ROYAL AIR FORCE



London Gazette, June 5, 1934

General Duties Branch

J. R. MacLachlan is granted a permanent commn. as Pilot Officer with effect from May 26 and with seny. of May 26, 1933.

T. R. Vickers is granted a short service commn. as Pilot Officer on probation, with effect from and with seny. of May 16.

The follg. are granted temp. commns. as Flying Officers on attachment to the R.A.F. (May 22):—*Sub-Lieutenants*, R.N.—G. R. Brown, F. Fletcher, J. A. Goldsmith, R. W. Little, J. F. Marmont, K. C. Ogilvie, H. E. R. Torin, *Lieutenant*, R.M.—W. H. C. Manson.

Lt. K. W. Goudie, Highland Light Infantry, is granted a temp. commn. as Flying Officer on being seconded for duty with the R.A.F. (May 23); F/O. A. P. C. Hannay, M.C., Capt., Cameron Highlanders, is granted the honorary rank of Flight Lieut. (Jan. 15); Pilot Officer on probation N. W. D. Marwood-Elton is confirmed in rank (April 26).

The follg. Pilot Officers are promoted to the rank of Flying Officer:—H. P. Burwood (Jan. 23); R. T. Gething (March 16); Viscount Acheson (April 7); C. F. M. Rambaut (May 18).

Wing Com. E. B. Beauman is restored to full pay from half-pay (May 23); Flt. Lt. N. A. West is transferred to the Reserve, Class C (March 15) (substituted for the notification in the *Gazette* of March 20); F/O. C. M. Rees is transferred to the Reserve, Class C (March 15) (substituted for the notification in the *Gazette* of March 20); P/O. P. D. Carden resigns his short service commn. (May 19).

Medical Branch

Flt. Lt. E. A. Gudgeon, M.R.C.S., L.R.C.P., is transferred to the Reserve, Class D (June 1).

Memorandum

C. W. Nicholl is granted a temp. commn. as 2nd Lieut. with effect from Feb. 15, 1919, and is permitted to retain the rank of 2nd Lieut. on relinquishing his commn. (Feb. 27, 1919).

PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE

Sister Miss E. E. Horsford is placed on the retired list at her own request (June 4).

ROYAL AIR FORCE RESERVE RESERVE OF AIR FORCE OFFICERS

General Duties Branch

The follg. are granted commns. as Pilot Officers on probation in Class AA (i) (June 5):—R. W. Gautrey, G. G. McLannahan (Acting Sub-Lieut., R.N.R.).

F/O. H. Garnett is transferred from Class BB to Class C (April 16). The notification in the *Gazette* of May 22 concerning F/O. R. H. Clay (Lieut., T.A.) is cancelled. F/O. J. V. Roberts relinquishes his commn. on completion of service and is permitted to retain his rank (April 18); F/O. T. H. Bevan relinquishes his commn. on completion of service (April 23).

Stores Branch

F/O. R. H. Clay (Lieut., T.A.) relinquishes his commn. on completion of service (May 1).

Medical Branch

Flt. Lt. W. Heron, M.B., B.Ch., relinquishes his commn. on completion of service (May 7).

SPECIAL RESERVE

General Duties Branch

W. B. A. J. Keppel is granted a commn. as Pilot Officer on probation (April 28); F/O. C. W. Lindsay is promoted to the rank of Flight Lieut. (April 7); P/O. T. R. Vickers resigns his commn. on appointment to a short service commn. in the R.A.F. (May 16).

AUXILIARY AIR FORCE

General Duties Branch

No. 601 (COUNTY OF LONDON) (BOMBER) SQUADRON.—G. H. Mansell is granted a commn. as Pilot Officer (April 27); F/O. N. R. W. Seely is promoted to the rank of Flight Lieut. (April 17).

No. 602 (CITY OF GLASGOW) (BOMBER) SQUADRON.—M. Robinson is granted a commn. as Pilot Officer (May 8).

No. 603 (CITY OF EDINBURGH) (BOMBER) SQUADRON.—C. E. R. Tait is granted a commn. as Pilot Officer (May 1); F/O. E. H. Stevens is promoted to the rank of Flight Lieut. (April 1).

No. 607 (COUNTY OF DURHAM) (BOMBER) SQUADRON.—J. Sample is granted a commn. as Pilot Officer (April 27).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Wing Commander E. B. Beauman to R.A.F. Depot, 23.5.34. Whilst attending Senior Officers' War Course, Greenwich.

Squadron Leaders.—P. Warburton, M.B.E., to No. 13 (A.C.) Squadron, Netheravon, 21.5.34. To Command vice S/Ldr. H. L. Rough, D.F.C. F. R. Alford, M.C., to Special Duty List, 30.5.34. Whilst employed on Armament duties with Superintendent of Research Dept., Woolwich. T. W. Elmhurst, A.F.C., to No. 15 (B) Squadron, Abingdon, 1.6.34. To command. A. O. Lewis-Roberts, D.F.C., to No. 142 (B) Squadron, Netheravon, 1.6.34. To command.

Flight Lieutenants.—G. D. Harvey, D.F.C., to Central Flying School, Wittering, 1.6.34. W. S. Allen, to D. of O., Dept. of C.A.S., Air Ministry, 17.5.34. C. S. Cadell to Special Duty List, 1.6.34. On appointment as

Aide-de-Camp to the High Commissioner for Egypt. D. H. Carey to No. 142 (B) Squadron, Netheravon, 1.6.34. J. A. Elliott to No. 2 (A.C.) Squadron, Manston, 1.6.34.

Flying Officers.—J. G. Llewelyn to No. 502 (Ulster) (B) Squadron, Aldergrove, 28.5.34. H. L. McCulloch to No. 9 (B) Squadron, Boscombe Down, 29.5.34.

Flying Officer J. L. C. Banks to Station Flight, Andover, 29.5.34.

Pilot Officer E. M. Lewis to No. 822 (F.S.R.) Squadron, 18.5.34.

Medical Branch

Squadron Leader A. Briscoe to Central Medical Establishment, 30.5.34. For duty as Medical Officer.

Flight Lieutenant E. Donovan to Station Headquarters, Biggin Hill, 31.5.34. For duty as Medical Officer on appointment to a Short Service Commission.

Metal Worker—Introduction of New Trade

It has been decided to abolish the trades of blacksmith and welder and of coppersmith and metal worker. These trades are to be regarded as obsolescent from the date of this order. They will be replaced by a new group 1 trade of "metal worker," and airmen of this trade will be qualified to perform the duties at present allotted to the two obsolescent trades.

As a result of this reorganisation certain reductions in establishments will be effected. New establishments will therefore be published with effect from April 1, 1935, which will follow the broad principle that one aircraftman of the new trade will be substituted for two aircraftmen (one of each of the present trades) in squadron establishments, and that a reduction, though on a smaller scale, will be effected in the number of aircraftmen allowed in other units. Non-commissioned officer establishments will not be affected by this general decision. Some time will elapse before airmen of the new trade are available to fill the posts on the new establishments, and airmen of the present trades will therefore be posted on the present basis to fill such vacancies as exist in the new establishments, e.g., a squadron for which an aircraftman metal worker is not available will receive two aircraftmen, one from each of the present trades.

All future entrants will be trained in the new trade, and conversion courses will be arranged to which existing personnel may be posted from time to time to enable them to remuster to metal worker. The first course commenced

at Manston on May 28 last. The course will normally be of about 12 months' duration.

Long Service and Good Conduct Medals

The Long Service and Good Conduct Medal has been awarded to the undermentioned airmen:—

W.Os. F. A. Coombs, C. E. Reed, B. H. Rolles, C. Turl, D.S.M.; W.O.2s J. G. Boyd, A. Fletcher, G. Magee, H. Vatcher, A. E. L. Worster; S.M.2 P. C. Stocks; F./Sgts. A. J. Aston, A. A. Bell, J. W. Bridle, A. E. Clark, H. Firth, F. Harris, E. G. Hollis, H. Lee, A. V. Lewis, J. Ling, E. W. Mason, A. McNab, E. S. McQuillan, A. A. T. Parker, S. T. Rainsbury, A. J. Russell, H. R. Saunders, W. Steele; Sgts. T. H. Auton, J. Braithwaite, C. Hare, A.F.M., S. Howard, G. E. Lord, A. E. Oliver, J. Russell, G. Smith, A. F. Whapshott, J. E. Whyte, A. E. Williams; Cpls. W. J. Clark, W. E. Cousins, F. G. Grace, R. Grice, A. Killen, P. McVicar, H. Richardson, A. Skinner, R. F. West, F. E. Whiting; Cpl./A./Sgt. A. N. Stapley.

AIR FORCE LIST

THE June issue of the Air Force List has now been published. It can be purchased (price 2s. 6d.) from H.M. Stationery Office at the following addresses:—Adastral House, Kingsway, London, W.C.2; 120, George Street, Edinburgh; 2, York Street, Manchester; 1, St. Andrew's Crescent, Cardiff; 15, Donegall Square, Belfast; or through any bookseller.

ROYAL AIR FORCE CHAPLAINS' BRANCH

THE Air Ministry announces that the King has approved the appointment of the Rev. Joseph Firth, M.C., Staff Chaplain, Royal Air Force, as an additional Honorary Chaplain to His Majesty.

The Rev. J. Firth was appointed a temporary Chaplain in the Army in October, 1914. He transferred to the

Royal Air Force in 1919, and was appointed Assistant Principal Chaplain for the United Board. In August of that year he was granted a permanent commission, and since April, 1929, he has held the post of Staff Chaplain. During the Great War he served in France, received the Military Cross, and was twice mentioned in dispatches.

SERVICE NOTES

Formation of No. 142 (Bomber) Squadron

NO. 142 (BOMBER) SQUADRON will form at Netheravon on June 1, 1934, and will come under the command of the Air Officer Commanding Central Area. The R.A.F. Station, Netheravon, will remain under the command of the Air Officer Commanding, Inland Area. No. 142 (Bomber) Squadron is the first of the new units provided for in the Air Estimates to be raised, or rather to be re-formed. It is to be stationed at Netheravon, the home of No. 13 (Army Co-operation) Squadron and of certain units of the Fleet Air Arm when ashore. No. 142 B.S. will be equipped with the Hawker "Hart" day bomber (R.R. "Kestrel" engine), and Sqd. Ldr. A. O. Lewis-Roberts has been appointed to the command. He has recently been on the H.Q. Staff of the Middle East Command. This squadron succeeds to the traditions of No. 142 Squadron (later re-designated No. 55 Squadron), which was raised at Ismailia in February, 1918. It spent the whole of its short war existence in Egypt and Palestine, and was equipped with an assortment of aeroplanes which had been superannuated from the Western Front, B.E.'s (2E, 2D and 12A), Martinsyde "Scouts," R.E. 8, and Armstrong Whitworths. Among its commanding officers was Capt. A. J. G. Styran, who afterwards won fame as a civil pilot and was killed quite recently in a flying accident. Everyone will hope that the new career of this squadron will be longer than its previous existence and quite as honourable.

R.A.F. Staff College, Andover

THE following officers have been selected for the 13th course at the R.A.F. Staff College, beginning January, 1935:—Flt. Lt. E. D. Barnes, A.F.C., L. K. Barnes, J. N. Boothman, A.F.C., G. P. H. Carter, R. H. Carter, C. J. Collingwood, D.F.C., W. A. D. Collingwood (Stores branch), A. D. Davies, E. S. C. Davis, A.F.C., G. Harcourt-Smith, J. D. I. Hardman, D.F.C., V. Harris, E. A. Healy, F. W. Long, S. D. Macdonald, D.F.C., G. H. Mills, G. E. Nicholletts, A.F.C., L. F. Pendred, M.B.E., D.F.C., N. A. P. Pritchett, J. W. Turtton Jones, T. M. Williams, M.C., D.F.C., F/O. H. W. Penney (Stores branch).

Officers who qualified at the 1933 and 1934 examinations, but have not been selected for the 1935 course, will be considered for the 1936 course. Separate orders will be issued regarding transfer to home establishment of those officers selected for the 13th course who are at present serving in overseas commands. The names of officers nominated by the Dominions to attend the 13th course will be published at a later date.

Portsmouth—Isle of Wight Area

AN officially recognised air traffic route between Portsmouth Airport and the Isle of Wight has been declared in Notice to Airmen No. 38/1934. Service aircraft are to avoid flying over the route, but when forced to do so should cross at right-angles and at an altitude of not less than 2,000 ft. Attention is also drawn to Part B of the above Notice to Airmen. As aircraft will be engaged in towing drogues and carrying out exercises in co-operation with shore-based guns, pilots are to avoid flying over the area laid down until further notice.

The Royal Air Force Dinner Club

THE 12th annual Dinner of the Royal Air Force Dinner Club will be held at the Connaught Rooms, W.C.2, at 8.15 p.m., on June 29th, when Air Chief Marshal Sir Edward W. Ellington, Chief of the Air Staff, will preside, and Lord Londonderry, Secretary of State for Air, will be the principal guest.

Blackburn T.S.R.

THE new Blackburn Fleet Torpedo Spotter Reconnaissance biplane (750-h.p. Siddeley "Tiger") has recently been tested, under service conditions, on an aircraft carrier. This machine was illustrated and described briefly in FLIGHT for May 17.

Australian "Seagulls"

THE Supermarine Aviation Works (Vickers), Ltd., has now received instructions to proceed with the order for 24 "Seagull V" amphibian machines (Bristol "Pegasus") for the Australian Government.

Move of No. 15 (Bomber) Squadron to Abingdon

NO. 15 (BOMBER) SQUADRON was to move to Abingdon on June 1, 1934, and to be transferred from Inland Area to Central Area with effect from that date.

No. 800 (F.F.) Squadron

NO. 800 (F.F.) SQUADRON embarked in H.M.S. *Courageous* from the R.A.F. Station, Netheravon, on May 14, 1934.

Fencing at the Royal Tournament

IN the Inter-Services Foil Championships at the Royal Tournament, Olympia, the Royal Air Force gained first, third and seventh places. Sgt. W. R. Hancock gained first place, AC. G. A. Daniel was third and Cpl. D. Grundy seventh.

The R.A.F. at Bisley

THE rifle championship of the Royal Air Force, which carries with it the Duke of Sutherland Challenge Cup, was won on June 6 by AC. G. Gaskell, of Andover, who is 21 years old. Flt. Lt. G. F. Stainforth won the revolver championship, and F/O. Tindal-Carill-Worsley the pistol championship.

R.A.F. Cricket Association

IN a cricket match against the Civil Service at Chiswick, on June 4 and 5, the Royal Air Force won by 7 wickets. The Civil Service made 173 and 233, and the R.A.F. 249 and 160 for three. The best score of the match was 91 by P/O. Loudon in the first innings.

The Royal Air Force Benevolent Fund

A COUNCIL Meeting was held at the offices of the Fund on May 23. Sir Charles McLeod, Bt., Chairman and Hon. Treasurer, was in the chair. The usual financial resolutions were carried. The Council were informed that grants to the amount of £1,793 18s. 3d. had been disbursed since the previous meeting on March 13, 1934. He also reported that the total expenditure on grants for the year up to date was approximately the same as in 1933, though the total number of applications dealt with, amounting to 945, exceeded that for the same period last year by over 100. A very generous response to the urgent need of the Fund by the Council of the Society of British Aircraft Constructors, and by various member firms of the aircraft industry, had resulted in the receipt of donations amounting to over £1,000, and the very prompt and valuable assistance thus given is very much appreciated.

The R.A.F. Display

AT Hendon Aerodrome an explosive magazine is being rapidly built to play the central part in the chief spectacular event at the R.A.F. Display on Saturday, June 30. The area in which the magazine is situated is defended by anti-aircraft guns and a balloon "apron," one of the balloons and some of the guns being visible. The "enemy" system of defence also includes fighting aeroplanes based at neighbouring aerodromes. In the opening scene the balloon apron is raised and the magazine is a hive of industry. Suddenly the blowing of sirens indicates that hostile aircraft are approaching the neighbourhood; motor transport hurries away and the anti-aircraft guns are manned, while the officers and men at the magazine hastily seek refuge at a safe distance. Overhead passes No. 54 (Fighter) Squadron, equipped with Bristol "Bulldogs," one of the many units ordered up to engage and drive off the attacking British aircraft. The engagement begins by an attack of fast two-seater fighters on the balloons of the apron to clear the way for the bombers. The one balloon visible falls in flames. The attacking fighters rally to their leader and to the assistance of the bombers, which are now approaching, hotly engaged by anti-aircraft fire from the ground and by the "enemy" fighter aircraft. But, despite casualties, the British formations remain unbroken, their superior marksmanship and carefully controlled fire causing many casualties amongst the "enemy" fighting aeroplanes. Remnants of the "enemy" formations are driven off, and the bombers approach the magazine, the adjacent guns opening fire. Bombs begin to fall, buildings blow up, and the furiously burning magazine is soon reduced to a heap of smoking ruins. The British attacking force will consist of two squadrons of day bombers (Fairley "Gordons" and Westland "Wallaces"), Handley Page "Heyford" twin-engined heavy bombers, and some single-seater fighters.

Correspondence

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.

THE CROYDON BEACON

[2933] I should like to say how pleased I was to read the paragraph in your leading article of to-day's issue headed "Croydon Tragedy."

As a member of the public using the commercial airlines to the Continent, etc., fairly regularly, it has always struck me how dangerous to aircraft, especially in bad visibility, this particular wireless beacon is, and I have heard many of the officials express the same view.

As you rightly say, it is a disgrace that some such tragedy as this occurs before those responsible for the safety of the air-travelling public and pilots make any move.

N. H. RICHARDSON.

London, E.C.2.

[2934] I would like to pay tribute to the splendid Editorial in this week's FLIGHT concerning the regrettable accident at Croydon. I also consider "A. Viator" should be highly commended for his foresight and his continued and persistent efforts to prevent this disaster, unfortunately without the success his endeavours deserved.

Apart from the two valuable lives which were lost, this accident must inevitably shake the faith, for the time being, of potential airway travellers. When a large airliner piles itself into someone's front garden adjacent to an important airport—and it might easily have demolished the house as well—just because red tape prevented the removal of an obviously dangerous obstruction, it stirs one with indignation.

Air transport is a growing child which should be given freedom to expand and progress, instead of being bound and tethered with red tape.

The pilot who observes the rules of safety, the airport manager who controls with safety, and the designer who constructs with a margin of safety, these are the men who should overrule high officialdom. And yet these high officials sit at their polished desks and pass resolutions which are ignored with impunity, while valuable lives and England's air prestige are at stake.

Your article on the subject is very amply and soundly expressed, and I trust it will sink well into the minds of those responsible for the short-sighted policy of ignoring important resolutions.

R. E. WILCK.

London, N.W.17.

The Industry

PICTURES IN ADVERTISING

AN exhibition of "Pictures in Advertising" has been arranged by Shell-Mex & B.P., Ltd. This will be held at The New Burlington Galleries, New Burlington Gardens, W.1, from June 20th until June 30th.

A CHANGE OVER

MR. C. G. LUMSDEN has relinquished his position as pilot to Imperial Airways to become sales manager and demonstrator to Percival Aircraft Co., the makers of the Percival "Gull."

ROLLS-ROYCE VISITORS

WHEN the Rolls-Royce Works at Derby were thrown open to the public for two days, in connection with Empire Air Day, more than 12,000 visitors took the opportunity of going to the works. A small charge was made for admission, and more than £250 collected and passed on to the R.A.F. Memorial Fund.

FLYING FAMILY

MR. PETER DE HAVILLAND has, with the move of the de Havilland Service Organisation to Hatfield Aerodrome, been appointed to the position of Receptionist for that Department. Owners of "Moths" or "Gipsy" engines will find him ready at all times to take their instructions and to execute their orders. He is the second son of Capt. Geoffrey de Havilland. His elder brother, Mr. Geoffrey de Havilland, Junior, is Assistant Instructor to the London Aeroplane Club.

"PTERODACTYL" DESIGNER LEAVES WESTLANDS

CAPT. G. T. R. HILL, well known as the designer of the "Pterodactyl," who has been engaged on development work in connection with this tailless aircraft at the Westland Aircraft Works, Yeovil, since 1926, will, in the autumn, be leaving that firm to take up an appointment to the Kennedy Chair of Engineering at the University College, London. Development work on this type of machine will continue and an announcement of interest will be released shortly.

PUBLICATIONS RECEIVED

The Airway Time Table. No. 1. June. Price 3d. London: Polebrook House, Golden Square, W.1.

Aeronautical Engineering Series, Ground Engineers: The Rigging, Maintenance and Inspection of Aircraft ("A" Licence). By W. J. C. Speller. Price 5s. net.

Inspection of Aircraft after Overhaul ("B" Licence). By S. J. Norton. Price 3s. 6d. net.

An Introduction to Aeronautical Engineering. Vol. II, Structures. By J. D. Haddon. Price 6s. net.

The Materials of Aircraft Construction. By F. T. Hill. Price 20s. net.

Handbook of Aeronautics. Vol. I. Price 25s. net. *Vol. II*. Price 15s. net.

Pilot's "A" Licence. By John F. Leeming. Price 3s. 6d. net. London: Sir Isaac Pitman & Sons, Ltd., W.C.2.

Flying for News. By Larry Rue. Price 10s. 6d. net. London: John Hamilton, Ltd.

NEW COMPANIES REGISTERED

KINGHAM & HUGHES, LTD.—Capital £1,000 in 1s. shares. To acquire lands or landed estates and buildings, and to carry on the business of operators, proprietors, charterers and letters on hire of aircraft, airships, motor boats, motor cars, lorries, and vehicles of all kinds, etc. The permanent directors are:—Edith Kingham, 35, Hampden Avenue, Beckenham, Kent; Frank K. Hughes, 9, Alfred Road, Sutton, Surrey.

AERO PICTORIAL, LTD., Chesham House, 150, Regent Street, W.1.—Capital £300 in £1 shares. To carry on business as aerial photographers, dealers in aerial and other photographs and films, trainers, suppliers and providers of expert personnel to individuals and companies desirous of producing aerial and other photographs and films, etc. The permanent directors are:—Cyril E. Murrell, 1, Pine Road, Cricklewood, N.W.2, aerial photographer; Archibald N. Kingwill, "Strathmore," Cooden Drive, Bexhill-on-Sea, aircraft pilot. Solicitor: C. G. Lawrence, Aldwych House, Aldwych, W.C.2.

YORKSHIRE AIRWAYS, LTD., The Aerodrome, Yeadon, near Leeds.—Capital, £5,000 in £1 shares. To acquire lands suitable for aerodromes, landing grounds, air parks and flying clubs, and to equip the same for all purposes connected with flying or flying clubs or the running of air services, etc. The first directors are: John L. Macalpine, Church Gate, Bolton-by-Bowland, Lancs (director of Hargreaves Collieries, Ltd.); Geoffrey H. Ambler, Chellow Grange, Bradford (director of Fred Ambler, Ltd.); Walter L. Hey, Weetwood Gardens, Weetwood, Leeds (director of J. Hey and Co., Ltd.). Solicitors: H. B. James and Morrish, North British Buildings, East Parade, Leeds.

WITNEY AND OXFORD AERO CLUB, 6, Broad Street Place, E.C.2.—Nominal capital, £100 in £1 shares. To promote, assist and encourage aerial navigation and the study of aeronautics, the development of all sciences connected therewith, and the design, construction, and repair of aerial conveyances; to institute and arrange for the conduct of instructional classes (both practical and theoretical), to establish and maintain a club and library, etc. The first directors are: Donald L. Townsend, 72, Torrington Park, North Finchley, N.12; Chas. D. Batt, Milton-under-Wychwood, Oxon; Victor J. Neyle, Witney Aerodrome, Witney, Oxon [all directors of Universal Aircraft Services, Ltd.]. Secretary (*pro tem.*): S. Avery. Solicitors: A. E. Samuels and Co., 36-38, New Broad Street, E.C.2.

INCREASES OF CAPITAL

SYWELL AERODROME, LTD., Bridge Street Chambers, Northampton.—The nominal capital has been increased by the addition of £3,500 in £1 ordinary shares beyond the registered capital of £1,500.

POBJOY AEROMOTORS, LTD., Aeroplane Manufacturers, etc., Hooton Park, Wirral, Cheshire.—The nominal capital has been increased by the addition of £17,000 in £1 ordinary shares beyond the registered capital of £23,400.

PATENT AERONAUTICAL SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors (The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

APPLIED FOR IN 1932

Published June 14, 1934

- 32,389. R. F. DAGNALL and A. H. REFFELL. Flotation gear for aircraft. (410,489.)
33,559. J. DE LA CIERVA. Aircraft having rotative wings. (410,532.)

APPLIED FOR IN 1933

Published June 14, 1934

- 2,811. AVIONS H. M. D. FARMAN. Centrifugal supercharging devices for aircraft. (410,720.)